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ABSTRACT

This document is one of three volumes (CE 018 033 and ED 143 814) which contain career education instructional units developed by college teachers to be infused in university-level courses. (See CE 018 030 for the report of inservice and curriculum development activities.) Chapter 1 of this document discusses career education philosophy and practice as it applies to postsecondary institutions. Chapter 2 summarizes the freedoms and constraints encountered by infusing and implementing career education in higher education. Chapter 3 contains a brief description of the development of the instructional units; a description of the unit format; and sixteen career education instructional units. These units are designed to infuse career education concepts and information in the following courses or curriculums: child development; microbiology; forest management; agricultural mechanization technology; resource and business management; agricultural and resource economics; agrostology; civil engineering; forest resources; electrical engineering; social studies; materials engineering; and math education. The concluding chapter presents unresolved issues in implementing career education in postsecondary education and suggestions for future efforts. (BM)

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CAREER EDUCATION IN HIGHER EDUCATION

VOLUME II

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FOREWORD

It was and continues to be the intent of the Center for Career Education to stimulate the implementation of career education in public schools, colleges and universities and other learning institutions with Maine and New England. The provision of in-service staff training, evaluation services and development of learning materials is a part of this mission. In 1977-78 staff efforts to infuse career education in the University of Maine system were continued. A major effort was made at the Orono campus to provide staff development services and curriculum preparation assistance. The material in Volume II is a report of our basic efforts and includes sample curriculum developed by the participants to infuse career education in university level courses.

It was a pleasure to work with the faculty and staff who participated in this third year effort. The interest and enthusiasm for openly examining the career education concept was evident throughout the seminar series and is reflected in the quality of each instructional unit. We doubt whether each faculty member had all questions or concerns fully answered, but detected in our evaluation processes a positive attempt to integrate some portion of the career education concept in his or her work.

This document is a result of qualitative work by the faculty and staff who participated. In addition, excellent editorial assistance was rendered by Bette Katsekas, research assistant; Robin Nadeau, project secretary; Jack Sutton, research associate and Bob Drummond, professor of education. Comments from scholars in higher education who use the material would be welcome.

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July 1978

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CHAPTER 1

CAREER EDUCATION: PHILOSOPHY AND PRACTICE

Career education as a concept has begun to stimulate faculty in post-secondary institutions to examine the reality of what is taught in relation to a variety of critical issues that plague our society. Technological invention and rapid change have impacted both the way we work and live in terms of life style. Values or patterns of belief have undergone rapid change and created a sense of dissonance in the behavior of many individuals. For many Americans the dualism between work and play has created differential reactions and in some cases an inability to draw sharp distinction between the two. Moral values are of critical importance, particularly as we attempt to assist youth in making choices between work and play. Work and the choice of an occupation continue to be of primary concern for the average citizen, even though the entry paths to the work world require successful passage through the educational credential system.

The above situation is compounded in the post-secondary institutions, particularly in those four year colleges or universities that disavow a responsibility to assist their constituents with career development needs. The specter of specialization or extreme focusing on the technocratic needs of society causes many academicians to reject concepts such as career education, vocationalism or career development. Individuals who are seeking to sort out choices and options often find little or no help in this process on collegiate campuses. If anything is true, the complexity of making a reasonable occupational choice consistent with one's interests, abilities and aptitudes is becoming more difficult. A central theme of career education is to help all individuals acquire the skills and values necessary to compete in life. It encompasses the broad goals of human development in tandem with the career needs of each individual.

Future growth and development predictions for institutions of higher education are cloudy in relation to student enrollments and programmatic growth. Scholars such as Bowen (1974) suggest that the higher education industry might double or triple in size prior to the year 2000. Froomkin (1974) takes a more pessimistic view and argues that college enrollments will probably decline because of limited growth in the number of entry level professional occupations for individuals who hold college degrees. The Carnegie Foundation report, More Than Survival (1975), predicts a leveling of enrollment into the mid 1990's and slight growth as we approach the year 2000. These findings indicate a period of uncertainty for the future of higher education.

A TIME OF TRANSITION

In projecting future development or trends in higher education, specific uncertainties must be considered. These uncertainties will affect curriculum planning,faculty selection and retention and program development. In particular, the implementation of a career education program will be given careful scrutiny by faculty and central administration in relation to availability of funds and institutional priorities. The critical trends that must be integrated within institutional planning are the following:

1. The state of the national economy in relation to fluctuations in price levels, inflation, unemployment and changes in the gross national product.

2. Labor market problems as they relate to educational investment are significantly tied to student admissions. The fear or over-credentialing may be a factor that causes potential students to seek other training programs or shift career goals.

3. Life style needs, particularly for youth ages 18-30, will have to have significant impact on enrollment.

4. The trend to competency-based education and alternate forms of completion for high school graduates portends a variety of shifts in advanced training needs. Potential students will be seeking admission to more individually tailored programs and the impact on curriculum could be significant.
5. Increasing numbers of women and older Americans will be seeking educational training and enrichment that must be made available in non-traditional ways. Educational planners will need to devise instructional delivery systems that accommodate a variety of work schedules, attendance problems and individual differences.
6. Public policy as articulated in federal and state legislation is of particular importance in planning for the 1980's. Funding for student aid, institutional research and development, and graduate education will probably remain at the level received during the 1970's. Inflationary monetary factors make it imperative that funding levels be increased if institutions of higher education are to maintain support for the same number of students who currently receive aid. Current funding levels in actuality provide fewer support dollars for new students who seek admission.

In practical perspectives, the future for higher education growth and development is cloudy. A moot question for faculty, administrators and trustees relates to "What program priorities and student recruitment strategies can we best support in order to retain institutional viability?" The career education concept may be the vehicle to provide relevant instruction, improve career advising and assist students in making more reasoned career decisions.

PHILOSOPHY AND PRACTICE

The career education term was popularized by Sidney P. Marland, former U.S. Commissioner of Education in the early 1970's. A central concept that permeates the theme of career education is the notion that education must include academic training and career guidance. Universities and colleges have a moral obligation to address all issues related to work in a technological culture and provide assistance to students in the form of career education. Academicians should make it a high priority to include work and its meaning in those courses provided to students as part of a degree program. Ethical values and their relationship to professional practice cannot be ignored until the students matriculate into a professional occupation. As Casella (1978) succinctly phrased it, "Professors must deal with the realities of work in relation to values, particularly as they present the content of a particular discipline."

Career education is best defined as a conscious effort to improve career development, counseling, exploration and cooperative education in the post-secondary institution (Harrisand Grede, 1977). In addition, career education requires a melding of the above constructs within the academic classroom. Quite simply, faculty and staff in the university and college will need to introduce the career implications of their work to all students, not just those enrolled in easily identified technical programs. In essence, blending esoteric reasoning with practical applications cannot be avoided in higher education institutions of the 1980's. The liberal arts will not be replaced for a narrow vocational focus, but they will be supplemented by the infusion of concern for work and career development needs of the attending clientele.

It is the teaching-learning process that is critical to acceptance of career education on the campus. University faculty will need to reexamine the process of teaching and their role in responding to the total needs of students. Providing for the cognitive training, while ignoring the affective dimensions of human development is no longer acceptable. Value concerns and ethical issues are too numerous to be handled by the counseling center or career planning office staff. Elitism as an unexpressed contempt for those who study business, education, science or technology serves only to retard productive interaction among all disciplines on a campus. Erroneous dichotomies between disciplines, departments or colleges must give way to (1) productive planning to include career exploration in the curriculum and (2) cooperative efforts that provide the student with career advising and planning in relation to their future plans. University educators must provide a truly comprehensive examination of the work options available in American culture.

The practice of career education provides options for meeting the differential needs of faculty and students. Faculty are most concerned with the teaching-learning process and the acquisition of knowledge for a specific discipline. Within this context their acceptance of career education is conditioned by the necessity to meet national accrediting standards and content demands within limited time allotments. Intrusions that call for additional instructional content or removal of material deemed critical have not been eagerly accepted. As a result, career education advocates must demonstrate that the infusion of this concept will not dilute the quality of any program. Some of the more acceptable practices for faculty use are:

1. The use of recent program graduates who can demonstrate content applications in the field or discipline.
2. The use of business and industry representatives who can participate in departmental seminars or discussions related to the interface between work realities, job skills and theoretical knowledge.
3. The use of standardized psychometric instruments to obtain data relative to student career interests.
4. The use of career planning and placement services to provide departmental majors with career information, resume preparation and job seeking skills.
5. The use of career education infused curriculum materials that have been prepared by professionals with academic creditability, particularly in their discipline.
6. The use of seminar training sessions to examine the career education concept and develop expertise in relation to curriculum infusion.

Some of the more representative career education programs nationally include varied components and missions. For example:

Birmingham Southern College: The Work - Learn Project is a collaborative exchange between a liberal arts college and representative organizations/agencies in business, labor, government and the professions. Faculty internships require a one month commitment to working on a community business agency.

Alma College, Alma, Michigan: A Career Preparation Program for liberal arts students that provides workshops, seminars, career resource information via a structured learning approach.

College of Education, Ohio State Univeristy: Career education activities in the college of education include both structured courses, field based experiences and in-service training programs for practicing professionals.

LaGuardia Community College, New York: this career education program had several specific objectives. First, to assist all faculty members in infusing career education concepts into their instructional activities. Second, to insure that students in both liberal arts curricula and occupational education programs receive work experience opportunities.

College of Education, Texas A & M University: The Center for Career Development is designed to conduct research, development and dissemination in the areas of career development and education.

Utah State University: a counseling center based decision-making program is the focus of their career education efforts. Faculty advisors are trained to assist students with their career development needs.

The above practices reflect a general trend to focus on career development practices as articulated through the career planning and placement offices. Institutional support of the career education concept will not necessarily result in general faculty acceptance. Professional recognition of the viability and need for career education will occur when an academic discipline (e.g. chemistry) and the parent professional society make implementation of career education a national priority. Faculty members will probably adopt the concept after this type of national recognition is readily visible. In essence, the liberal arts, applied sciences and engineering disciplines will be reluctant to use career education as a vehicle for curriculum reform until official sanction and some guarantee that their efforts will be considered in salary/promotion decisions.

CHAPTER 2

FREEDOMS AND CONSTRAINTS IN HIGHER EDUCATION

Infusing and implementing career education in the post-secondary institution is a difficult task. The uniqueness of higher education institutions in terms of governance, faculty autonomy, clientele and varying missions prohibits one single definition. American colleges and universities number about 2,500 and each institution is unique. The philosophical premise of higher education implies that the pursuit of knowledge for its intrinsic value is a noble goal and it is possible that this premise serves as a restrictive value in implementing concepts that appear vocationally oriented. Career education in substance may imply to many faculty an undue reliance on career needs of students and be the antithesis of research activity. The purpose of this chapter is to explore several of the relevant issues related to implementing career education in institutions of higher education.

The critical issues related to implementing career education require an understanding of the university or college environment. Governance, curriculum, students, faculty and auxillary services are the five elements that generally constitute an institution's organizational pattern. In general, the common characteristics of four-year institutions are:

1. Restricted and selective admissions based on meeting certain entrance qualifications. Admission to professional education and liberal arts is not a "carte blanch" process.
2. Educational offerings are generally offered by specialized departments, institutes and colleges. In fact, a university is generally a union of separate colleges united under the jurisdiction of a quasi-legal body charted by the state.

3. Tuition costs range from low at state supported public or municipal institutions to extremely high at private colleges.
4. The faculty is committed to research and knowledge generation for its intrinsic worth and is less concerned about utilitarian application. This assumption must be tempered by the observation that schools of education, business, engineering sciences and agriculture provide field experiences for their students to apply theoretical concepts.
5. Professional programs must receive and continue to maintain national accreditation, particularly in education, business, engineering, science and forestry.
6. Collegesand universities seek to attract clientele from a national market and to enhance what is referred to as "national visibility." Research and development grants from federal, state and private foundations are critical to this thrust.
7. Students in colleges and universities represent a mix of ages, aspirations and career interests. In addition, the multiple life style needs of today's student places pressure on central administration for alternative living arrangements, access and control of various substances (alcohol, etc.) and some form of participation in institutional governance.
8. A rigid faculty-staff separation that places central power for curriculum control in the hands of those holding professional appointment.

The above characteristics are not meant to be inclusive and others may wish to argue the merits of those cited. Other important characteristics may be absent from this list and would need to be included. As a result of those unique characteristics the college and university must respond to myriad pressures from state legislators, parents, alumni, friends, students and faculty for a variety of services that is often beyond their capability to deliver.

At the risk of offending some of our readers, it is our opinion that curriculum relevance, assisting students with career development and providing conditions that encourage faculty creativity are the most important issues confronting higher education. The uniqueness of higher education is a plus factor in addressing curriculum reform and providing student assistance. The freedom that exists in university settings provides opportunity for creativity that does not exist in the business-industry world. This is not to imply the opportunity for creative thinking is not available in these settings, but by their very nature higher education institutions are predicated on a knowledge generation premise and this means new theories and applications of conceptual ideas. It is possible that career education could have impacted the college or university to a greater extent if federal funding in the early 1970's had been channeled to scholars for research and development efforts in this area.

Freedom as used in the context of this chapter implies certain conditions that facilitate the nurturance of new ideas and models for testing. Illustrative freedoms in higher education are:

1. Freedom to investigate ideas, test models and suggest applications without fear of political interference.
2. Freedom to pursue knowledge in areas of inquiry that may be unpopular with various societal elements.
3. Freedom to develop, revise and test new curriculum models without securing public approval.

4. Freedom to consult with various societal sectors without undue fear of disturbing "sacred cows." The university professor enjoys a level of prestige that renders his/her opinion as expert and it requires considerable public failures to lose this confidence.
5. Freedom to be creative in an institutional setting that thrives on new knowledge. In particular, new learning models that stimulate student motivation and interest are particularly sought.
6. Freedom to challenge old shibboleths that retard intellectual growth and restrict the faculty in pursuit of knowledge.

Naturally, these freedoms demand a sense of responsibility and some loyalty on the part of faculty to institutional goals. At the same time, this freedom requires all faculty and staff to seriously examine the career education in a spirit to open inquiry. Preconceived notions or stereotypes regarding the word "career" can serve to retard infusion into existing learning models.

In contrast to the cited freedoms there are several serious constraints that impede implementation of career education in higher education. As a result of critical observation over the last three years, we have been able to identify six major constraints that must be resolved:

1. Excessive faculty teaching loads act to restrict teaching innovation. As a result of budgetary crises of the last four years central administration has resorted to leaving unfilled vacancies as a result of natural attrition. It is not uncommon to find faculty who teach 12 to 15 credit hours per semester and average about 100 advisees in addition.

2. Budgetary reductions have reduced the number of teaching assistants available to assist faculty with routine tasks associated with the teaching process. As a result, time for creative curriculum development is further reduced.
3. The pressure of inflationary economics has reduced real take home pay for faculty and resulted in the pursuit of consultancies or other forms of renumeration. Also, the opportunity to earn extra salary via teaching in continuing education, extension or summer school works to reduce faculty energy and creativity.
4. Work in terms of ethics and acceptance as practiced in the business-industry world is not viewed as a scholarly endeavor. Discussion of work and attendant values is not viewed as a matter of high importance for inclusion by most faculty in their classrooms. The evaluation of higher education over five centuries reflected a bias that learning was for a select few and that those endeavors deemed "occupational" were not worthy of inclusion in the curriculum.
5. Accrediting societies and associations tend to be restrictive in their insistance on adherence to established professional standards. Reliance on external agencies for official sanction of new innovations, particularly in curriculum, serves as an inhibiting function. In a sense, merely meeting prescribed standards may serve more as a deterrent to experimenting with new or revised learning models.

6. Bureaucratic procedures tend to become increasingly complex as institutions attain increased size or historical chronology. Practices become accepted because it was accepted de facto over a period of time. In spite of the avowed search for truth there is considerable reliance on accepted past practices. In retrospect, established institutions of over 50 years existence may be the most difficult in which to implement career education.

These constraints are several of the more common encountered in attempting to implement career education in a medium size state university.

In sum, efforts to implement career education in a medium size state university have met with partial success. Defining a model for career education in higher education is not possible unless the cited constraints are addressed in planning efforts. The sheer number of post-secondary institutions (circa 2,500) existing in the United States with their missions and clientele will call for a variety of models. It is difficult to posit any one approach as the "model" for interested institutions. The process used to introduce career education on the Univeristy of Maine at Orono campus may have applicability in other similiar settings. Interested higher education planners are encouraged to contact the Center for Career Education for detailed information.

CHAPTER 3

CAREER EDUCATION INSTRUCTIONAL UNITS

Issues surrounding career education philosophy and practice have been recognized by, albeit not a direct part of, most contemporary sectors of our institutions of higher education. Too many other issues, such as faculty salaries, current trends in student enrollment, and funding of programs have taken precedence, perhaps due to their expediency, as opposed to longer-range results. The past decade in particular, has been filled with many intense changes and political turmoil on our college campuses; often times planning, curriculum development and student advising have received less attention than many students and faculty would have preferred.

Since our last report on the seminar series of 1977, the national picture has not drastically changed - but, once again, the results of the present university-based seminar series illustrate that faculty interest concerning the infusion of career education concepts into their particular discipline exists at a very high level.

The 1977-78 seminar participants were required to develop and then field test a career education unit within their own academic area. The seminar series was similiar in design to last year's, with the incorporation of additional faculty members from the colleges of Life Sciences and Agriculture, Engineering Science and Education. Once again, the overall objectives were:

1. To assist the seminar faculty in developing a career education instructional unit; and,

2. To provide the necessary materials and consultation to the participants preparing each unit.

As in 1977, the results of these efforts yielded examples of university-based career education units prepared for distribution nationally. If these units serve as a representative sample of the potential support and talent which might exist, then the learning of concepts and practical applications of career education may be a reality for the future students of higher education.

In order to ensure consistency and ease of application for other professionals, each participant followed the model which is illustrated below for his/her unit development. In some cases, minor variations were used in order to accommodate teaching style and/or a specific need of a particular academic area. All units adopted the model headings and descriptions which follow:

MODEL FOR UNIT DEVELOPMENT

The intent of the present model is to effectively communicate the specific intents and outcomes of the instructor and learner, respectively. Consistent procedures of unit development and/or refinement enhance the production of high-quality curriculum material at minimum cost within time constraints (See Volume I, 1977). It is suggested that this model be used in the preparation of an instructional unit for publication. The unit format contains:

INTRODUCTION

The discussion of the purpose(s) of the instructional unit and a brief overview is presented.

UNIT GOAL(S)

A global statment of direction, intent and/or long-range aim(s).

UNIT OBJECTIVE(S)

A specific statement of intention(s) in terms of observable and/or measurable student performance. Each objective should contain at least one of the three following criteria:

1. What the learner must do.
2. Under what conditions and with what materials it should be done.
3. Standard of performance to be met - how the teacher and the student will know that a specific standard or level of accomplishment has been attained.

Such unit goals should have at least one performance objective which is stated such that its accomplishment leads to movement toward a goal.

LEARNING ACTIVITIES

Activities which may be in the classroom, on campus or in the community which lead to the attainment of a particular objective. At least one learning activity should be outlined for each performance objective. The content should be in topic form, describing generally the concepts, skills, and personal knowledge afforded to the learner.

EVALUATION

The specific techniques and/or procedures which are used to assess learner outcomes, ongoing process and/or program effectiveness.

TIME CONSTRAINTS

The recommended time frame for unit presentation.

RESOURCES

Additional texts, tests, persons, curriculum material, lists, and field experiences which the learner may use in fulfilling the various objectives.

The units also make use of standardized system of abbreviations which are explained below:

HO = Handout

ES = Exercise Sheet

TR = Transparency

UMO = University of Maine at Orono

The use of a standardized unit procedure as well as the standardized abbreviations above were an integral part of the unit development procedure; the intent was toward more consistent designators and a process framework which would facilitate more effective communication among colleagues concerned with career education.

The following units are intended for all faculty who teach within an institution of higher learning. The departments represented are diverse in interests, yet they share a common concern for a core curriculum in career development. As in last year's project, feedback to the present authors is essential for improved efforts. Inter-campus communication will serve as an important predecessor and adjunct for career education's infusion into present programs and its subsequent infusion on a larger scale.

APPLICATIONS OF CAREER EDUCATION IN CHILD DEVELOPMENT

Melda M. Brandt

INTRODUCTION

Many students decide to major in Child Development because they "like children" and think they would like to work with children in some type of educational or social service program. In order to clarify their career goals, students must make a number of decisions. One decision is whether or not they do, in fact, want to work with children. Some students who have had only casual experience with children, or who have enjoyed learning about child development in a course, often find out in a more concentrated experience in an early childhood program, that it is not what they want to pursue. A second consideration for students is the age range of children with which they would prefer to work. Some students enjoy only preschool or early primary children; others prefer children in the intermediate grades; still others are comfortable with a wide range of ages. A third consideration is the type of program in which students would like to work. Many students are familiar only with the public school classroom and are not aware of other options such as day-care, Head Start, or hospital-play programs.

The unit described below is to be part of a course called "Practicum in Early Childhood Programs," which serves primarily first and second-year students. All students in the course have had a basic child development course, which emphasizes knowledge about developmental patterns and various influences on development. Building on this knowledge, the "practicum" course emphasizes skills and values related to work with young children. Class time is spent in detailed discussion and practice of different interaction models and techniques, and students participate weekly in an early childhood program.

The purposes of the unit are: (1) to increase students' awareness of their preferences, strengths, and weaknesses; (2) to increase their awareness of career opportunities; and (3) to help them relate their preferences to various career options. The purposes will be accomplished through self-awareness exercises to be completed outside of class, an evaluation conference with the practicum supervisor, class discussions, visits to early childhood programs, and a final synthesizing paper.

GOALS

One goal of the unit is to increase students' awareness of their preferred interaction style with children. This will help students define the age range most suitable for them and the type of philosophy with which they would be most comfortable. Included in this goal is assessment of strengths and weaknesses, and directions for future growth. A second goal is to increase students' awareness of career opportunities in child development and the different responsibilities included in different types of jobs. A third goal is to help students relate what they have learned about themselves to the various career options so they may begin to clarify their career goals.

OBJECTIVES

The first goal stated above is to increase students' awareness of thier preferred interaction style with children. Related to this goal are objectives one to four:

1. Students will be able to describe in written form the techniques and styles of interaction with which they feel most comfortable.

2. Students will be able to describe in written form the similarities and differences between their preferred interaction style and the models of interaction discussed in class.
3. Students will have a conference with their practicum supervisor to discuss his or her evaluation of their strengths and weaknesses.
4. Students will be able to describe in written form what they believe to be their strengths and weaknesses in interacting with children and to specify directions for future growth.

A second goal is to increase students' awareness of career opportunities in child development and the different responsibilities included in different types of jobs. Related to this goal is objective five:

5. Students will obtain specific information about different child-development-related jobs. The information will include the nature of the job, specific responsibilities, working conditions, needed skills and educational qualifications.

A third goal is to help students relate what they know about themselves to the various career options discussed in class. Related to this goal are objectives six and seven:

6. Students will be able to describe in written form the type of job(s) they think they might prefer.
7. Students will be able to describe in written form the characteristics of themselves that they think would contribute to success in their preferred job.

LEARNING ACTIVITIES

To meet the learning objectives, students will participate in the following learning activities:

Objective 1: To meet this objective, students will participate in several self-awareness activities.

Activity 1a: Students will respond in writing to nine "critical incidents" described in the workbook Be Honest with Yourself. Each incident describes a situation in an early childhood program in which a teacher would need to respond. Several open-ended alternatives are suggested for students to complete. The workbook encourages thinking beyond teacher behavior to feelings of the people involved and the effectiveness of reactions by asking questions such as: "How do I feel about the child (or children)?"; "How does the child, or how do the children, feel about my reaction?"; "How do I feel about my reaction?"; "What is the likely outcome of my reaction?"

Activity 1b: Students will complete the form called "Probable Reactions"from the book Be Honest With Yourself. This form asks students to respond to a series of forced-choice statements about their interaction patterns, such as "I work best with groups of children" vs. "I do my best work in a one-to-one relationship." Students are then asked to write a brief description about themselves based on their chosen statements.

Activity 1c: Students will complete the form called "Past Performance" from the book Be Honest With Yourself. This form asks students to respond to forced-choice statements about general attitudes and preferences, such as "Prefers to be boss" vs. "Prefers to be subordinate" or "Works well with parents" vs. "Prefers to work without parents." Students are then asked to write a descriptive paragraph based on their choice.

Activity 1e: Students will prepare a final, synthesizing paper. The first part of the paper will be a description of their preferred interaction style, based on what they have learned about themselves through the first four awareness activities.

Objective 2: Objective 1b will be met through preparation of the final paper. In the second part of the paper, students will discuss the similarities and differences between their preferred interaction styles and the three models of interaction discussed in class.

Objective 3: Prior to completion of the final paper, students will have individual conferences with their practicum supervisors to discuss the supervisor's evaluation of the students' strengths and weaknesses. The discussion will be based on the evaluation form in the book Be Honest With Yourself, which will have been completed by the supervisor prior to the conference.

Objective 4: Three activities are included to meet this objective:

Activity 4a: Students will complete the same evaluation form that is given to the practicum supervisor. Students will use the form to evaluate their own strengths and weaknesses. The evaluation form should be completed near the end of the practicum, but before the conference with the supervisor.

Activity 4b: Students will complete the forms "Clues to Good Teaching" and "Teacher Survival Quotient" from the book Be Honest With Yourself. Both forms describe behaviors or attitudes that have been found to characterize "good teachers" and ask students to evaluate themselves with respect to the behaviors and attitudes.

Activity 4c: In the third part of the final paper, students will describe strengths and weaknesses in their interaction patterns based on the evaluation of their supervisor and their own self-evaluation. Students will also specify directions for future growth, including aspects of their interaction style which they feel they can or cannot change.

Objective 5: To meet this objective, students will participate in two learning activities.

Activity 5a: Students will interview two people who work in different jobs related to child development. A form will be completed for each interview to ensure that students obtain information regarding the nature of the job, specific responsibilities, working conditions (e.g., hours, pay, interstaff relations), and needed skills and educational qualifications.

Activity 5b: Students will participate in a class discussion in which information from the interviews is shared. The discussion will give students information beyond their own two interviews and will provide the opportunity to compare different descriptions of jobs considered to be the same.

Objective 6: In the fourth part of the final paper, students will describe the type of job they think they would prefer, based on their knowledge about themselves and their knowledge of the responsibilities and requirements of different jobs.

Objective 7: To meet this objective, students will attach to their paper a letter of application for the job (or one of the jobs) described in the fourth part of the paper. In the letter, students will describe characteristics of themselves that they think will contribute to their success in that job. The purpose of the letter is to attract the potential employer enough to "open the door" for an interview.

EVALUATION

1. Student achievement will be evaluated on the basis of the final paper. Criteria for evaluation will include completion of all supporting self-awareness and self-evaluation activities, thoroughness and clarity of self-description and self-evaluation, accuracy of description of interaction models discussed in class, accuracy of description of preferred job choice, and the quality of the letter of application. The evaluation criteria will be specified on an evaluation sheet, which will be returned to students with comments explaining the ratings.
2. Program effectiveness will be evaluated by:
   a. The general quality of the students' final papers; if the unit has accomplished the stated learning objectives, then the quality of the final papers generally should be good.
   b. Student evaluations of the unit; students will be asked to rate the unit as a whole and each of the specified learning activities on a 1 to 5 rating scale. For each rating, students will be encouraged to make comments about why the activity was beneficial or about ways in which the activity or unit as a whole could be improved.

TIME CONSTRAINTS

The unit will be infused throughout the last four weeks of a one-semester course. Many of the learning activities (self-awareness and self-evaluation activities, conference with supervisor, interviews and the final paper) will be completed outside of class. Approximately four class periods will be devoted to the unit: one to explain the unit and the various learning activities; one to discuss the students' self-awareness activities in relation to the interaction models discussed in class; one to discuss the students' interviews with professional people; and one to discuss preparation of resumes and letters of application. Students will be encouraged to confer with the instructor at any time during the unit for help in preparing the final paper.

RESOURCES

1. Books:

   Croft, D. J. Be honest with yourself. Belmont, CA.: Wadsworth, 1976.

   Evans, E. Contemporary influences in early childhood education. New York: Holt, Rinehart & Winston, 1975.

   Gordon, T. Parent effectiveness training. New York: Wyden, 1970.

   Morrison, G. G. Early childhood education today. Columbus, OH.: Merrill, 1976.

   Read, K. The nursery school (6th ed.). Philadelphia, PA.: Saunders, 1976.

2. Instructional Resources:

   Child Development Learning Center, School of Human Development, University of Maine at Orono.

   Practicum supervisors in the Child Development Learning Center, University of Maine at Orono.

   Resource people in jobs related to child development.

3. Handouts:

"Directions for Final Paper," including criteria for evaluation of the paper.

"Form for Recording Information from Interviews of Individuals in Child Development - Related Jobs"

HANDOUT 1

Directions for Final Paper

The purpose of the final paper is to draw together and synthesize the information you have been gathering about: (1) your preferred interaction style with young children (including strengths and weaknesses and directions for future growth); (2) three models of interaction frequently used with young children; and (3) different jobs involving work with young children. The paper should help you clarify your career goals by relating what you have learned about yourself to the various career options available to you.

Your paper should include the following four parts:

Part 1: This part of the paper will be a description of your preferred interaction style, based on what you have learned about yourself from the self-awareness activities in the text Be Honest With Yourself. Carefully review the nine "Critical Incidents," and "Preferences and Attitudes" forms. Using the information from these forms, describe your preferred interaction style. Use specific responses from the forms to support your points where appropriate.

Part 2: Describe the ways in which your preferred interaction style is similar to and/or different from the three models of interaction discussed in the course. Be sure your discussion reflects the most important similarities and differences and accurately portrays each model.

Part 3: Describe what you consider to be your strengths and weaknesses in interaction patterns, based on your self-evaluation and on your evaluation conference with your practicum supervisor. Refer to the self-evaluation form, "Clues to Good Teaching," and Teacher Survival Quotient" from the text Be Honest With Yourself. Specify directions for future growth, including aspects of your interaction style which you feel you can or cannot change.

Part 4: Describe a specific job or type of job you think you would enjoy, based on your knowledge about yourself and your understanding of the responsibilities and requirements of the job. Attach to your paper a letter of application for the job you have described. The letter should describe characteristics of yourself that you think would contribute to success in the job. The purpose of the letter is to attract the potential employer enough to "open the door" for an interview.

Attached as an Appendix to your paper should be all the self-awareness and self-evaluation forms used in the preparation of your paper.

The criteria for an outstanding paper are:

- All supporting self-awareness and self-evaluation activities are completed and included in the Appendix.
- Self-description in Part 1 is thorough, clear, and accurately reflects information in the self-awareness activities.
- Description of interaction models is clear and accurate.
- Self-evaluation is thorough, perceptive, and realistic.
- Description of preferred jobs reflect accurate understanding of job requirements and responsibilities.
- Letter of application effectively portrays your qualifications for the job.

- Paper is well-written; thoughts are logically organized and clearly expressed, using correct sentences and spelling.
- Paper is typed, neatly presented, and on time.

HANDOUT 2

Form for Recording Information from Interviews of Individuals in Child Development-Related Jobs

Name of Interviewer:

Date & Time of Interview:

Name of Person Interviewed:

Job Title:

Employer (Agency, Organization, Business):

Nature of Job and Specific Responsibilities:

Working Conditions:

Hours:

Salary and Fringe Benefits (some people may not wish to reveal this):

Interstaff Relations (lines of authority, cooperation among staff, autonomy vs. restrictions, etc.):

Educational Qualifications(degrees, certification, etc.):

Specific Job Skills Required (administrative experience, budgeting, experience with exceptional children, etc.):

Major Sources of Job Satisfaction:

Sources of Job Dissatisfaction:

APPLICATIONS OF CAREER EDUCATION IN MICROBIOLOGY
A New Dimension in Tissue Culture Technology

Charles Buck

INTRODUCTION

Career education during the academic tenure of many students enrolled in science-oriented courses is often very limited or completely lacking during the four years they spend at a University. This seems to be especially true for the senior microbiology majors leaving this university. Up until only a few years ago, the microbiology major could complete four years of course and laboratory work and feel confident in obtaining employment in practically any section of the country they wished to be employed. Those with good grades, high GRE scores and satisfactory references often continued on for the M.S. and/or Ph.D. degrees. This utopia came to an end in the late 1960's and the microbiology major, along with most other graduates, encountered a competitive labor market that required time and organized effort in order to find a desirable position.

During the 1960's up to the present time, much of the research in microbiology has been oriented toward the study and control of virus diseases. It was decided in this department that more emphasis should be placed on providing courses that would give the student training that prepared him or her for work in laboratories studying virus diseases and malignant conditions in animals. With these guidelines in mind a course in "Tissue Culture Techniques" was developed for senior and graduate students in microbiology and allied fields. The course is divided into several units. Some units terminate after a few weeks while certain projects last the entire semester.

The course is a four-hour course and meets twice weekly for three hours each time. Usually about one hour of the three is used for lecture and demonstration and the rest of the time is designated as exercise time to develop laboratory techniques. A brief outline of the course is as follows:

Unit 1 - Introduction to Tissue Culture

- a. Preparation of various types of media for tissue culture.
- b. Growing cell lines supplied by instructor.
- c. Start plant tissue culture after preparing plant tissue culture medium.
    1. Plant tissue growth is obtained from freshly dug carrots in the fall.
    2. This experiment will be continued for entire semester as plant tissue culture grow very slowly.
- d. Each student must satisfactorily complete these assignments before moving on to more difficult techniques.
- e. Usually one of the cell lines being studied will be grown under different than normal conditions. This procedure makes the student aware of the importance of standard conditions to produce good cell growth. If it is necessary to change conditions the acclimatization procedure is long and drawn out.
- f. Discussion of problems that may develop.

Unit 2 - Independent Research Techniques

- a. Student is directed to choose a research project to work on for the rest of the semester.
- b. After project is approved the student prepares a detailed outline for the particular project chosen.

c. During the last week of the semester the students hand in a technical report of their research and then present their research report orally to the rest of the class.

Unit 3 - Primary Cell Cultures

a. Primary cell cultures are prepared from embryonated eggs of a guinea pig or other small animal.

b. Primaries are carried through several transfers and some students are encouraged to transfer them until they die out of a cell line if developed; most will die out.

c. Students must continue to prepare all necessary media in order to keep their cell lines healthy.

d. Discussions of problems that may develop.

Unit 4 - Application of Cell Culture

a. Infect cells with virus to show cytopathic effect.

b. Count virus in various solutions by plaques assay.

c. Increase virus concentrations.

d. Show virus cell specificty.

e. Do infectivity studies and determine ID_{50} of virus solutions.

f. Make chromosome spreads and determine the number of chromosomes in the individual's own, primary, and cell line cells.

g. Prepare autoradiographs of cells treated with radioactive cellular components.

h. Inoculate cells with virus and determine intracellular virus replication by fluorescent microscopy.

Unit 5 - Presentation of Research

a. Hand in paper.

b. Oral presentation of materials.

The completion of this course by the students will improve their confidence in being able to perform in a knowledgeable manner if they obtain employment related to virus or tissue culture-related problems. However , there are other factors relating to career education that should be presented at various times during the course. For example, discussions related to self-awareness, career-awareness and decision-making would be appropriate infusion activities. Short discussion sessions could be developed around these topics as they relate to trends in the field and would be valuable in helping students examine the decision-making process and its impacts upon their future plans.

GOALS

It is the intent of this course to provide advanced level students in microbiology an opportunity to develop specific content knowledge and laboratory skills that relate to future career plans.

1. Within the framework of this course it is possible to present information at various times that will make the student more aware of the practical application of the information obtained from this course and the career available for consideration.
2. With proper guidance the student will be able to realize the importance of well-planned research projects in order to systematically complete problems encountered in various job descriptions.
3. The student will be able to utilize his or her time in this course to obtain the maximum amount of career-oriented skills and information.
4. Plans are being formulated to have two speakers, one from industry and one from a health-related field, to present their views to the class. Hopefully both will be former graduates

from the Microbiology Department, University of Maine at Orono.

OBJECTIVES

The following objectives should be used to plan learning activities for this course:

1. The students will be able to identify reasons for participating in career education.
2. The student will have a more realistic outlook on problem solving techniques.
3. The student will be able to better evaluate his or her abilities, interests and strengths.
4. The student will have a better idea of the types of positions available for individuals with their training.

LEARNING ACTIVITIES

Each of the following activities should be used to organize individual and group discussions with the students.

1. Introduce the career education concept:
    a. Identify reasons for the development of career education.
    b. Identify course objectives to be accomplished and how they relate to career education goals and objectives.
2. Each student will complete a job application and write a career resume that illustrates personal plans and action implementation steps (See HO 1).
3. The students will be encouraged to visit a laboratory where tissue culture and virological techniques are being used in realistic work situations.

4. Visiting scientists should be invited to meet with students to discuss career satisfaction and related topics (See HO 2).

EVALUATION

It is suggested that the following procedures be used to evaluate student growth:

1. University/college course evaluation form if available.
2. Standardized assessment instruments:

   Self Directed Search. Palo Alto, CA.: Consulting Psychologists Press, Inc., 1973.

   Strong-Campbell Interest Inventory. Palo Alto, CA.: Consulting Psychologists Press, Inc., 1976.
3. Oral report of laboratory visitation and reactions from visit.
4. One-page evaluation of the course as it relates to career education.

TIME CONSTRAINTS

It is intended that career education concepts be infused during the semester as the schedule dictates and students reactions be obtained via summative evaluation procedures.

RESOURCES

The following resource materials are available to support infusion of career education into this course.

1. Books:

   Harris, N. C. and Grede, J. E. Career education in colleges. San Francisco, CA.: Jossey-Bass Publishers, 1977.

   Hoyt, K. B. A primer for career education. Washington, D. C.: Office of Career Education, September, 1977.

2. Instructional Resources:

   University Career Planning Office Staff

   Alumni (recent program graduates)

   A Career Interview Guide

   A 5 Year Career Plan

HANDOUT 1

5 Year Career Plan

The motivated individual who wishes to control his/her life must plan the sequential process that faciliates goal achievement. We all want to be "something" or "someone" but quite often lack the knowledge or experience to articulate our plans. A suggested model is as follows:

I. Self Analysis - identification of interests, abilities and personality factors:

A. Interests - list hobbies, leisure time activities, etc.

____

____

B. Abilities - list specific skills or talents (known)

____

____

C. Achievements - list experiences over life span (activities you did)

____

____

D. Personality - list personality variables that describe you (happy, sad, etc.) most of the time.

____

____

II. Career Goals - identification of career goals:

1 Career Goal	2 Skills Needed	3 How Obtained

4 Verification of Skill	5 Time Commitment

III. Resources - identification of resources needed to accomplish career goal.

A. Training

B. Financial

C. Personal (parental support, etc.)

The above exercise can be filled in by the student and discussed in either individual or group sessions.

Developed by C. W. Ryan, College of Education, University of Maine at Orono, 10/8/76.

HANDOUT 2

A Career Interview Guide

The purpose of the interview is to get information about work, the worker, the work setting, and the general affect of the work on the individual's life style. Both "likes and dislikes" should be brought out. Use this guide, but try to be somewhat informal.

When you begin your interview, inform the person being interviewed of the real purpose of the interview. Encourage the person to talk freely about his or her job--and listen carefully. Ask questions that encourage the person to think about the important things that are involved in the job or career--which they have.

Use these questions but don't limit your inquiry to these questions; you might not want to use all of them with every person.

---

1. What is the official title of your job?
2. How long have you been on this job?
3. How did you first get involved in this kind of work?
4. What are some of the major tasks that you do in your work?
5. What other jobs have you had? How are they related, it at all, to the job you now have?
6. What training or education is required for this job?
7. What do you like most about your job? What do you like least?
8. How does your job affect what you do or don't do off the job?
9. If you could do it all over again would you still select this kind of work? Why or why not?
10. What gives you the most satisfaction in the work you are now doing?
11. What future work or career goals do you have? What job or work do you hope to be involved with ten years from now?

12. What do you think are some important things that a person who is considering going into this kind of work should know about it?
13. Do you feel that you have a career? If so, are you happy with it? What causes you to feel the way you do about it?
14. What other comments would you like to make?

A record should be made of the interview. A tape recorder can be used if it does not inhibit the person from talking freely.

The record of the interview should include the following: date of the interview, place of the interview, name and approximate age of the person interviewed, job title, number of years work on this job, a summary of the interview, and any general observations or impressions gained from the interview.

Developed by Robert A. Ristau, College of Education, Eastern Michigan University, Ypsilanti, Michigan, 1975.

APPLICATION OF CAREER EDUCATION IN FOREST MANAGEMENT

David S. Canavera

INTRODUCTION

Interest in preserving the forests we now have and improving environmental quality has undoubtedly made Forest Management an appealing major to large numbers of students, expecially those from urban areas. The job market, however, has not increased as rapidly as student enrollment, thus creating a current nationwide surplus of Forest Management majors. Another factor affecting securement of meaningful employment for students is their often inadequate or incomplete understanding of what a career in Forest Management entails even after their completion of four years of study.

GOAL(S)

The intent of the proposed unti will be to provide an opportunity to Forest Management seniors to assess the current status of their personal career development. Many of our students are still uncertain as to what their specific career goals are, even after four years of professional forestry training. The emphasis of this unit will be to point out that the individuals themselves are responsible for their own personal career planning.

Students will also be made aware that career development is a continuing process. Too often they erroneously get the idea that a four-year college education has prepared them for a specific niche where they can be comfortable for the rest of their lives if they can secure employment in that area. All too frequently they do not investigate alternate areas of employment for which they are also qualified.

This unit may be infused into a senior seminar course. The senior seminar is a "capstone" course which is designed to provide the students (working in teams) with an opportunity to integrate all of their course learnings and to solve a realistic land management problem.

OBJECTIVES

1. To assist each student in developing career plans and identifying several alternate career possibilities.
2. To develop student awareness of the continuing need and importance of effective interpersonal communication in their career development.

By accomplishing objectives 1 and 2, the students will recognize that career development is a continuing process.

LEARNING ACTIVITIES

The methods used to accomplish the objectives will be to present several topics to students, have them write their thoughts on the topics, and then discuss their opinions in the seminar. Class size should be restricted to 8 or 12 students and there should be ample opportunity for open discussion. The following discussion questions have been carefully selected to achieve the unit's objectives:

1. What were your conceptions of a career in Forest Management before you entered a professional forestry program?
2. What do you think a career in forest management entails now (after you have studied it for four years)?
3. Do you know what the current employment opportunities are in forest management and has this affected your decision to pursue a professional forestry career?

4. How much money will you realistically be making on a forestry career?
5. Projecting yourself five years into the future, speculate on what your feelings might be concerning the following:
    a. Self
        1. What kind of person will I be?
        2. What will I value?
        3. How will I act as that kind of person?
        4. What type of lifestyle do I want?
        5. Where do I want to live?

    b. Career
        1. Will I be working primarily with people, data or things?
        2. Will I be an operative employer? Supervisor or middle management? Top management?
        3. What are my career motives? Use Handout 1 on page 47. What type of people will I primarily be associated with?
    c. Leisure and Self-Expressive Time
        1. What will I do with my time (other than work)?
        2. In what ways will I be able to express myself?

After you have considered these points, do you think that a career in forestry can satisfy your needs?

6. What skills do you now possess that you did not have before you entered college?

7. Have any of the skills you learned in college prepared you for types of employment other than those directly related to forestry?
8. Have each student complete a 5 year career plan (See Buck unit, HO 1, pg.38).

In addition to discussion of the selected topics, one guest lecture will be given by an experienced professional forester on the topic: "What It Takes to Succeed as a Forester in Today's World." Emphasis of his or her presentation will focus on the fact that today's foresters work primarily with people and not with trees.

EVALUATION

The outcomes of this unit are to be assessed by student responses to the following questions:

1. What was your general reaction to this unit?
2. Did you find the unit helpful?
3. What were the strengths of the unit?
4. What could be changed to make this unit better for you?
5. Additional comments/suggestions/questions.

TIME CONSTRAINTS

The unit will be given in a minimum of three one-hour class periods, but may be extended beyond this if deemed necessary.

RESOURCES

1. Articles:

Robie, E. F. Employment of 1976 forestry graduates. Journal of Forestry, 1977, 75, 268-270.

Theoe, D. R. Employment of 1975 forestry graduates. Journal of Forestry, 1976, 74, 165-168.

Vasey, R. B. & Dr. R. Theoe. Enrollment trends in professional forestry schools, 1972-1976. Journal of Forestry, 1977, 75, 270-72.

2. Book:

   Mitchell, Joyce S. I can be anything. New York: College Entrance Examination Board, 1975.

3. Resource person - a practicing professional forester.

4. Handouts:

   Career Motives List

   5 Year Career Plan (See pg. 38)

HANDOUT 1

CAREER MOTIVES LIST

1. To have people admire my work
2. To travel
3. To shape my own work
4. To have a well-organized life
5. To be in a position of power
6. To have new or unusual experiences
7. To be able to constantly learn
8. To have lots of money
9. To accomplish something important
10. To see tangible results
11. To be a leader
12. To have to work hard
13. To control my own schedule
14. To avoid pressure
15. To keep myself neat and clean
16. To have freedom in my work
17. To have a lot of free time
18. To do my own thing
19. To be in a position to give orders
20. To be carefree
21. To plan and organize
22. To have people come to me
23. To spend my time doing things for others
24. To be in charge
25. To be my own boss
26. To work for the good of society

Source: Hansen, Lorraine, S.; Klaurens, Mary K. & Tennyson, W. W. in Life Styles and Work: A Career Education Resource Guide. (Minnesota Department of Education, 1972).

APPLICATIONS OF CAREER EDUCATION IN AGRICULTURAL MECHANIZATION TECHNOLOGY

Thomas E. Christensen

INTRODUCTION

Agricultural Mechanization includes the application of engineering developments in the fields of agriculture and forestry. The Agricultural Mechanization Technology associate degree recipient has covered the basic and practical aspects of the subject and is qualified to work at the technician level.

This unit is the outline for a first semester orientation seminar required of students in the Agricultural Mechanization Technology program. Few students, if any, have a broad knowledge of the career opportunities available in the technical areas of agriculture and forestry. This seminar is designed to give the students an overview of the field, explore new directions in the field, develop career awareness, establish career goals, and give assistance in preparing a job-search plan.

GOALS

Goals of this seminar are for students to:

1. increase the student's awareness of the career opportunities in the field.
2. broaden the student's knowledge of the technical level of the field.
3. increase student awareness of procedures used to obtain employment in the field.

OBJECTIVES

The following describe the objectives of student performance expected for this unit. The students will be able to:

1. identify several career options available in Agricultural Mechanization and be able to list three possible alternatives consistent with their interests and abilities, and
2. develop and practice the skills necessary for resume writing and employer contact.

LEARNING ACTIVITIES

The following activities will be implemented to elicit a high level of student involvement.

1. Have the student assess values, job interests, job attitudes through administration, interpretation and discussion of the following tests:
   a. Strong-Campbell Vocational Interest Blank (SVIB)
   b. Employment Readiness Scale
   c. Career Maturity Inventory - Attitude Scale
2. Have the student participate in panel discussions with various resource persons from the field concerning career possibilities and trends.
3. Have the student search recent field-oriented periodicals for new developments of interest, such as, equipment, fabrication techniques, management techniques and new businesses.
4. Have the student identify and prepare a list of prospective employment areas in the field, with designation regarding the geographical areas and employers involved.
5. Have the student complete resume and job application procedures for several prospective employers in the desired area (See Shertzer, 1977, pg. 327).

6. Have the student identify areas of employment that are desirable to him or her.
7. Have the student select supporting elective courses that would be helpful in preparation for the desired employment area. Discuss the relation and validity of each of the courses in the support program.

EVALUATION

1. Secure student evaluation of the seminar through local course evaluation forms.
2. Secure student opinion reports to industry and employer representatives.
3. Conduct a follow-up study one year after graduation to evaluate effectiveness of career selection, preparation and job-search awareness activities from student's viewpoint and his/her employer.

TIME CONSTRAINTS

Twelve weekly class meetings, 50 minutes each is suggested.

RESOURCES

1. Instructional Resources:

   Shertzer, B. Career Planning. Boston, MA.: Houghton-Mifflin, Co., 1977; 327.

   Industry and local employer representatives

   Topic outline for seminar in Agricultural Mechanization Technology:

   a. inventory of interests and attitudes
   b. a historical view of technology in the field
   c. panel discussions with industry and employer representatives.

d. current directions in research - new products
e. investigation of career opportunities in field
f. expectations of employers on the job
g. self measurement of job performance
h. factors involved in evaluation of careers
i. setting of career goals
j. factors involved in selection of job-search area
k. resume and application preparation techniques

Secure a list of representatives in businesses and industries.

2. Assessment Instruments:

Strong-Campbell Interest Inventory, Palo Alto, CA.: Consulting Psychologists Press, 1976.

Employment Business Scale. Athens, GA.: Anthony M. Alfano, Department of Counseling & Student Personnel Services, College of Education, Aderhold Building, University of Georgia, 1976.

Career Maturity Inventory. El Monte, CA.: CTB/McGraw Hill, 1973.

SEMINAR ON CAREER EXPLORATION IN THE FIELD OF RESOURCE AND BUSINESS MANAGEMENT

Wallace C. Dunham

INTRODUCTION

The focus of this seminar is to orient students enrolled in the Resource and Business Management Program to alternative career options available to them. It has been observed that a number of students enrolled in this program lack a general sense of purpose or direction. They seem to express a general aimlessness and inability to involve themselves in the educational process in a truly meaningful way.

Part of the above circumstances may be attributed to lack of basic information concerning occupations, careers and the world of work. Some students are enrolled in the program on the basis of inadequate information, misconceptions, misunderstandings, inadequate information, inexpediency, or external pressures. Many are uncertain as to goals and opportunities.

Another frequently encountered problem revolves around the lack of self-understanding exhibited by many students. Few students have a realistic cnception of their own potentials, interests, values, aptitudes and motivations. Many have had little opportunity to inventory and/or explore these characteristics.

As a result of the above situations, many students are uncertain as to their future career goals. The purpose of this seminar is to develop a greater self and career-awareness regarding future plans in the participants.

GOALS

The goals of this seminar are for students to:

1. gain knowledge of self as related to job satisfaction in the area of resource and business management;
2. gain knowledge of the spectrum of careers offered by successful completion of a program of study in the area of resource and business management, and
3. gain knowledge of the skills necessary in order to perform successful job-related tasks in various career options in the area of resource and business management.

OBJECTIVES

For each of the preceding goals, certain objectives for student performance are set forth. Students, upon completion of this unit, will be able to:

1. list at least five personal life goals,
2. list the positive and negative features, in terms of personal life goals, of at least three career options,
3. be able to identify four specific facts about self as revealed by the interest inventory scores,
4. be able to identify three possible job options consistent with the knowledge gained from objective three above, and which could be obtained upon completion of the program in resource and business management,
5. have an understanding of the competencies which they need to develop in order to achieve one or more career objectives, and
6. have the knowledge involved in the preparation of a letter of application and resume.

LEARNING ACTIVITIES

The learning activities planned for this unit are as follows:

1. Each student will complete the following assessment instruments:
   a. Strong-Campbell Vocational Interest Inventory
   b. Self Directed Search
2. At least one class session will be devoted to the area of values clarification. The purpose of this session will be to aid the students in identifying their values and interests (See Vitro unit in Vol. III).
3. One or more class sessions will be held to familiarize students with resources such as the Occupational Outlook Handbook, the Career Planning and Placement Office, and with agencies such as the Maine Employment Security Commission and local private employment services.
4. Each student will be expected to analyze three jobs of interest to them. This analysis will include such things as: duties, qualifications, preparation needed, methods of entering, time required to attain skills, normal career progression possibilities, related occupations, earnings, and conditions of work. As a part of this analysis, each student will interview a total of at least five persons currently employed in one of these jobs. A written report will be submitted on both the analysis and interviews.
5. Several class sessions will be devoted to the preparation of letters of applications and a personal resume. Each student will be expected to prepare a letter of application and a resume for a job of interest to them.

6. Several class sessions will be devoted to seminars with business, industry and public service representatives.

EVALUATION

This seminar is to be conducted on a pass/fail basis. To receive credit for completion of the seminar, participants must be present at a minimum of twelve of the fourteen sessions and all assignments must be rated satisfactorily by the instructor. For an assignment to be rated satisfactorily it must be complete and meet the seminar objectives.

TIME CONSTRAINTS

Seminar sessions will be held once each week during a fourteen week semester. Each session is 50 minutes in length. The seminar carries one course credit.

RESOURCES

1. Assessment Instruments:
    a. Strong-Campbell Vocational Interest Inventory, Consulting Psychologists Press, Palo Alto, CA., 1976.
    b. Self Directed Search, Consulting Psychologists Press, Palo Alto, CA., 1973.
2. Instructional Resources:
    a. Community resource persons
    b. Selected faculty resource persons
    c. UMO Career Counseling Center personnel
3. Books:
    a. Occupational Outlook Handbook, Bureau of Labor Statistics, U.S. Department of Commerce, Washington, D.C., 1977-1978.
    b. Simon, S.; Howe, L. W. & Kirschenbaum, H. Values Clarification. New York: Hart Publishing, Co., 1972.

APPLICATIONS OF CAREER EDUCATION IN AGRICULTURAL AND RESOURCE ECONOMICS: A CAREER DEVELOPMENT SEMINAR

F. Richard King

INTRODUCTION

The goal of the Department of Agricultural and Resource Ecnomics at the University of Maine is to improve life for Maine people through teaching, research and extension.

The specific missions of this department are to advance knowledge and contribute to problem-solving in the social science aspects of agricultural resource development, community resource development, and natural resource development.

The department is interdisciplinary in nature. Staff members have training in agricultural and resource economics, rural sociology, sociology, community development, public administration and education. The faculty of the department plan and coordinate teaching, research and extension programs in the three major areas of agricultural business management and marketing, community development and natural resource development.

The purpose of this seminar is to provide a forum for career education applicable to students in four of the seven degree programs in the department. The seminar is primarily for students in Baccalaureate Degree programs in Agricultural and Resource Economics, Resource Ecnomics, Rural Sociology, and Recreation and Park Management. It will consist of fourteen two-hour sessions. It will normally be taken in the sophmore year and is designed to provide a follow-up to the Freshman Orientation program.

GOALS

Upon completion of the seminar the student should have a much clearer perception of the relationship between the world of work and classroom activities, broader knowledge of possible careers in the various degree programs and a greater understanding of his or her own career goals and learning objectives.

The seminar is designed to cover the following topics:

1. Introduction to Career Development. The purpose of this topic is for the student to gain a basic understanding of concerns included in career development.
2. Self-Awareness. The first step in career development is to get a better perception of where one is and where one is heading. The purpose of this unit is for the students to become more aware of their own desires, personality and potential.
3. Career Awareness. Most students have had little or no experience that enables them to relate knowledge about them selves to career objectives in an organized fashion. The purpose of this unit is to assist the student in this process and help in developing career goals.
4. Decision-Making in Career Development. The purpose of this unit is to increase the students' knowledge of the many resources available to aid in career decision-making.
5. Exploration of Specific Careers. The purpose of this unit is to make the student aware of possible career opportunities in the various major areas of interest within the department. Most students enter the program because of personal contact, because the name appeals to them, or by accident. Very few students have an adequate mechanism to determine career possibilities open to them upon completion of their degree program.

6. Employability Skills. The purpose of this unit is for the student to clarify his or her understanding of the skills needed in at least two career areas of interest. The unit will also assist the student to develop a plan to obtain these skills.

OBJECTIVES

The following objectives are general in nature and are meant to be infused in the seminar topics.

1. The student must demonstrate that he or she understands what is involved in career development and how the world of work relates to classroom instruction. This understanding will be demonstrated by writing an essay which describes specific relationships between a work situation and three courses they have taken (Use with Topics 1 and 5).
2. The student will complete a minimum of two self-awareness exercises (Allport, 1960 and Johnson, 1972) and the Strong-Campbell Interest Inventory. The student will then develop a profile of themselves (Use with Topics 2 and 6).
3. The student will develop career and learning objectives. The objectives will include specific activities in order to clarify career objectives (Use with Topics 3 and 6).
4. The student will become familiar with decision theory, the resources, and the materials available to assist in decision-making related to career choices (Use with Topics 3 and 4).
5. The student will be able to profile at least six work situations in the area of their major interest. The student must explore, through contacts in the working world, the requirements of at least two possible careers (Use with Topics 2, 3, 4, 5, and 6).

The interview format used with the Buck unit (p. 40) is also suggested here.

7. The student will develop a learning plan which consists of various activities, including field experience and specific courses, which will assist him or her to obtain the skills necessary to be employed in their chosen fields. (Use with Topics 3 and 6).

LEARNING ACTIVITIES

These learning activities were designed for broad application and maximum student involvement.

1. A lecture/discussion format is suggested for the meetings of the seminar with sufficient time for individual questions.
2. Reading assignments will be made and placed on reserve in the UMO library.
3. Students will complete the Strong-Campbell Vocational Interest Inventory and participate in various self-awareness exercises (Use with Topic 2).
4. Classroom discussion and use of the Occupational Outlook Handbook, the Dictionary of Occupational Titles and other resources available to assist the student in career awareness, for example, Terkel, 1974 (Use with Topic 3).
5. Each student will be expected to conduct two interviews, one in each of two different occupational clusters, in relation to their high interest scores on the Strong. The findings will be reported in class (Use with Topic 3).

6. Each student will write a reaction paper covering readings in decision-theory. Discussion in class will relate theory and applications to career choices (Use with Topic 4).
7. The student will profile at least six work situations of interest based upon guest speakers, panel discussions and reading. Further, the student will explore in detail, through contacts in the working world, two possible careers other than those explored in activity 5 (Use with Topic 5).
8. The student will develop a learning plan to obtain the skills necessary to be employed in at least two chosen fields (Use with Topic 6).

EVALUATION

The suggested evaluation procedures will include:

1. The student will complete an essay relating courses which he or she has taken to the world or work.
2. Completion of the Strong-Campbell Interest Inventory.
3. Student reports on the interviews with people working in two occupational clusters and completion of visitation logs.
4. Reaction paper written by the student on decision-theory applications to career choices.
5. Students will complete profiles of two possible careers related to their major.
6. Students will develop a personal learning plan based upon their career goals and objectives.
7. Standard course evaluation forms will be filled out by each student.

TIME CONSTRAINTS

The seminar is planned for a maximum of fourteen sessions of two hours duration over the academic year. It is suggested that sessions be held every other week.

RESOURCES

1. Instructional:
    a. Career Counseling Center - University of Maine at Orono
    b. Community, Business and Agency Personnel
    c. "Career Information Questionnaire," adapted from Stanley Ferguson, University of Maine at Farmington, and Paul Plenyak, Board of Education of Baltimore County, Towson, Maryland.
2. Assessment Instruments:
    a. Strong-Campbell Interest Inventory, Palo Alto, CA.: Consulting Psychologists Press, 1976.
    b. Allport, G. W.; Vernon, P. E. & Lindzey, G. A. A study of values. Boston, MA.: Houghton-Miffling Co., 1960.
3. Books:
    a. Johnson, D. W. Reaching Out. New Jersey: Prentice-Hall, 1972.
    b. Occupational Outlook Handbook, Washington, D.C., U.S. Department of Commerce, Bureau of Labor Statistics, 1976-77.
    c. Dictionary of Occupational Titles, U.S. Department of Labor, Washington, D.C.: Government Printing Office, 1977.
    d. Terkel, S. Working. New York: Avon Books, 1974.

APPLICATION OF CAREER EDUCATION IN MICROBIOLOGY: A CAREER ORIENTED COURSE

Melvin Gershman

INTRODUCTION

Instructors teaching introductory courses have the opportunity of not only exposing students to their respective expertise, but of furnishing an experience that might determine the student's ultimate direction and/or occupation.

The leisure and affluence existing today, coupled with a desire to do something useful, rewarding, and socially acceptable has motivated many individuals to return to school. An increasing number are taking continuing education courses to advance their ambitions, placate interests, develop some minimal skills, or, to explore and sample the academic environment.

Microbiology as a discipline provides significant insights into the various life processes. Not only does it constitute a basic discipline in and of itself, but it is also a required foundation to pursue other areas of interest within the biological field. In keeping with the "new" career orientation and emphasis permeating universities, it is important to stress the pivotal position of this science with interviews, fieldtrips and temporary employment if possible. In essence, it would be a SEE approach (Study, Exposure, Experience).

GOAL(S)

Microbiology should be designed and taught with the following goals in mind in order to develop an overall career awareness in microbiology:

1. To acquaint the student with this particular discipline and its significance to society.
2. To provide information regarding training, and required course work.
3. To expose students to the opportunities and career options available to "newcomers."
4. To provide students opportunities to meet microbiologists and observe working conditions.

Five major instructional areas should be emphasized - they include:

Unit 1 - Introduction to Microbes - History and Contemporary Application
Unit 2 - Microbial Anatomy, Physiology and Genetics
Unit 3 - The Growth and Control of Microorganisms
Unit 4 - Infectious Diseases and Immunity
Unit 5 - Community and Industrial-Based Activities Involving the Use of Microorganisms

OBJECTIVE(S)

Two instructional areas (Units 1 and 3) will be looked at here in order to exemplify the infusion of a career awareness within an area of microbiology:

Unit 1 - Introduction to Microbes: History and Contemporary Applications

Microorganisms will be described and compared. Their omnipresence will be stressed. Among other things, their past and present role in fermentation, disease and research will be noted. Students should be introduced to various professionals and graduate students to update and augment their knowledge on the use and study of microorganisms. In addition, they will also be able to learn in a direct, and perhaps more meaningful way, the types of training scientists have and identify courses required to pursue their line of activity.

Texts, supplementary outside reading, and interviews will be necessary to complete this assignment successfully. Performance will be evaluated on the basis of exams, interview participation, and an in-depth report covering the career opportunities existing in the field of microbiology.

The student should be able to:

1. Identify, describe and compare the basic varieties of microorganisms that exist in our environment.
2. Discuss the relative size of microbes and the units of measure employed to note their dimensions.
3. Define spontaneous generation and discuss the arguments for and against this doctrine.
4. Explain and give examples of the process of fermentation.
5. List ways microbes contribute to our welfare.
6. List and explain innovative ways microbes are presently being used.
7. Conduct an interview with a microbiologist engaged in a commercial, public health or research activity using microbes as a tool.

Unit 3 - The Growth and Control of Microoganisms

In microbiology, a major effort is devoted to growing and characterizing microorganisms. This unit will concern itself with the basic nutritive requirements of microbes and the culture media and environmental factors necessary for their subsistance. The student will learn various procedures used to isolate and stain a pure culture and will become familiar with the biochemical and serological methods required to identify an isolate. Sensitivity testing to ascertain therapeutic efficacy and sterilization methods will be explained.

The student should know:

1. The general nutritive requirements of microorganisms and be able to list media that can be used to grow hardy and more fastitious organisms.
2. The composition of frequently used laboratory media.
3. The properties of selective and differential media, and enrichment broth.
4. How to manipulate the physical environment to cultivate organisms.
5. How to do a quantitative analysis.
6. How to inoculate fermentative tubes and read the ensuing reactions.
7. How to stain specimens.
8. How to ascertain effectiveness of disinfectants and chemotherapeutic agents.
9. How to operate an autoclave.

Each student should visit either a hospital, dairy laboratory, water treatment plant, or comparable facility to observe the above methods in operation and the working conditions of those involved.

LEARNING ACTIVITIES

The learning experience will involve instruction, a project report and a field exposure.

The primary course content will be provided by lectures, classroom demonstrations, and outside reading of journals, appropriate texts, and popular publications. A project report identifying a significant career aspect of microbiology will be required, and a field exposure in the form of an interview with suitable personnel in food science, dairy industry, public health and hospital laboratories, university research units, and so on,will be expected. Students should be encouraged to request and/or volunteer for some form of active participation in the work they observe. This type of exposure and experience could be useful to the student in the process of selecting a career.

An interview format modeled after one presently in use by first-year students in the College of Life Sciences and Agriculture will be used (See HO 1). This exercise should provide the student with a more intimate picture of the profession. Additional points follow:

Job Interview Guide

The purpose of the interview is to get information about work, the worker, and the work setting. Both "likes and dislikes" should be brought out. Using HO 1 as a guide, the student will be encouraged to try and be somewhat informal. When beginning his or her interview, the student should inform the person being interviewed of the purpose of this exercise. The person should be encouraged to talk freely about his or her job -- and the student should listen carefully.

EVALUATION

Regular and routine examinations will be given over lecture material. In addition, the student's interview and project report, evaluated on overall organization, depth, and documentation will contribute 10 percent to the total grade.

TIME CONSTRAINTS

Approximately three weeks (7.5 hours of instruction) will be devoted to each unit. The student will also be required to budget the adequate time required to conduct an interview, write a project report and hopefully, to have an actual "working" experience.

RESOURCES

1. Instructional:

Text: Anderson, D. A. Introduction to microbiology. St. Louis, MO.: C. V. Mosby Co., 1973.

DeKruif, P. Microbe hunters. New York: Harcourt - Brace, Inc., 1966.

Video tapes: Microbes and Men. (Public Television Library - Video Program Service, 475 L'Enfant Plaza West, S.W., Washington, D.C. 20024).

Films: Careers in Microbiology. (American Society for Microbiology, 1913 I St., N.W., Washington, D.C. 20006).

Local hospital, industrial or university staff and personnel involved within microbiology.

HANDOUT 1

THE INTERVIEW

Name of person interviewed: ____________________

Address: ____________________

1. Job Title ____________________

2. Number of years on the job ____________________

3. How did you first get involved in this kind of work? ____________________

____

____

4. What are some of the major tasks that you do in your work? ____________________

____

____

5. What training or education is required for this job? ____________________

____

____

6. What do you like most about your job? ____________________

____

____

7. If you could do it all over again, would you still select this kind of work? ________ Why or why not? ____________________

____

8. What gives you the most satisfaction in the work you are doing now? ____

____

____

9. What do you think are some important things that a person who is considering going into this kind of work should know about it? ________

____

____

10. What other comments would you like to make? ____________________

____

APPLICATION OF CAREER EDUCATION IN AGROSTOLOGY

Rollin C. Glenn

INTRODUCTION

Agrostology is the study of turf grasses and their use and culture. The discipline covers turf species, adaptation, botany, growth habits, culture requirements and use, benefits or limitations.

In modern usage, "turf" means a grassy surface. The use of turf dates back to biblical times. Turf was used extensively during the seventeenth and eighteenth centuries as lawns and as grass strips in gardens. Although turf culture has been practiced for centuries, it wasn't until 1880 that turf culture became a real science and art. The first research on turf was initiated by the Michigan Agricultural Experiment Station. Many other experiment stations now do extensive turf research. The major gains in the use and knowledge of turf have occurred since 1950.

Use of Turf. Turf is used in a wide variety of situations, which may be grouped into three general categories: (a) functional, (b) recreational, and (c) ornamental. A functional use is a use to solve a problem, such as glare control, noise suppression, heat dissipation, dust and mud elimination, soil erosion, boundary delineation, and pollution. Recreational uses involve play: football, baseball, field hockey, croquet, lawn tennis, polo, rugby, shooting and hiking. Under these uses, the turf must be able to withstand heavy trafficking. Ornamental uses of turf provide beauty and attractiveness to a landscape. The aesthetic value of turf is becoming increasingly important, particularly in relation to the mental adjustment of people in densely populated areas.

The first green grass in spring serves to break the mental depression resulting from the long winter.

The most extensive use of turf is on residential lawns (see table below). A good lawn adds significantly to the value of a home. It provides beauty, an area for play and family activity, and functions to keep mud and dust away from the house. The second largest use category of turf is in conservation of soil, primarily along roadsides.

Turfgrass use category	Percentage of total turf use
Residential lawns	69
Roadsides	11
Cemeteries	8
Golf courses	6
Parks	2
Public Schools	1
Air fields	0.8
Commercial lawns	0.6
Universities and colleges	0.4
Other	1.2

The Turf Industry. Turf culture in the United States is more than a $5 billion industry. The value of herbicides and fertilizers sold for turf use exceeds $500 million annually. Institutions, such as universities, easily invest $100,000 or more annually in direct turf care. Many golf courses spend well over $100,000 annually caring for turf on greens, fairways and clubhouse lawns. The average homeowner can invest $2,000 getting a lawn established, and $300 to $500 a year in maintenance. Lawn care equipment constitutes a large percentage of sales in most hardware stores. Many students of turf science and culture may eventually establish their own contractual business in sod production, turf establishment and turf maintenance.

UNIT GOAL

The overall goal of this unit is to assist the students in becoming more aware of the various careers which are available in turf management.

OBJECTIVES

The student interested in turf management as a career should understand that successful turf management requires:

1. Knowledge of the adaptation, growth characteristics, growth requirements and management needs of all important turf species.
2. Development of turf programs for any use situation, and
3. A desire to satisfy the preferences of the people served.

LEARNING ACTIVITIES

1. Each student interested in turf management as a career will select at least three careers to further research from the following list of briefly described professions. Part of the research will include an interview with the person in the field, using the format suggested by Shertzer (1977, p. 328).

The following occupations are illustrative of those in the field of Agrostology.

Golf Course Careers:

Golf courses employ turf professionals at three levels: (a) Greenskeepers, (b) Golf Course Superintendents, and (c) "Pro" or Golf Professional.

Greenskeepers: Large golf courses (18 holes or more) employ greenskeepers who are primarily responsible for the culture of the turf on the greens, tees and fairways. Grass species selection, mowing patterns, mowing height, mowing frequency, fertilization, weed control, pest control and irrigation must be integrated to provide the proper quality of play and challenge to the golfer. High traffic on the turf is a major factor that must be dealt with. The greenskeeper must be able to plan culture practices around players, manage work crews, and supervise maintenance of equipment and supplies. A successful greenskeeper is soon recognized and promoted. Salaries for greenskeepers vary with the size of course, but generally rank highly when compared to most careers.

Golf Course Superintendent: This career requires a broader knowledge than is required for a greenskeeper. The superintendent is responsible for all operations and activities on the golf course. This includes not only the greens, tees, and fairways; but in addition, total landscaping, buildings, equipment purchases and maintenance, modifications and renovations, tennis courts and many other facets. Ability to supervise and work with people is essential. Salaries paid to superintendents rank along with those received by professionals in the legal field.

Golf Pro: A career as "Golf Pro" usually starts after 10 or more years as a greenskeeper and superintendent. A "Pro" becomes the manager of a total country club, including clubhouse, pro shop, restaurant, bar, tournaments and other events. Pros may also offer instruction on how to play the game of golf. The Pro must be an expert businessman and public relations person. Salaries of Pros rank among those of professionals in the medical field.

Sports Field Turf Careers: Careers in sports turf are generally connected with universities and large municipalities, and usually involve football and baseball fields, tennis courts and bowling greens. Speed of the players, response of play objects, injuries, all-weather playing conditions and aesthetics must be integrated in the turf culture system. Salaries are normally in line with those of greenskeepers of golf courses.

Conservation Turf Managers: Careers in conservation turf management are usually available in state highway department, federal agriculture agencies and airports. The turf use may involve erosion control, dust and mud suppression, heat and noise suppression or boundary delineation. These careers require a thorough knowledge of the functional uses of turf and how to integrate the use and management of the turf with other structures or landscape materials, and activities such as traffic. In these cases, turf culture is vastly different from sports turf.

Conservation turf managers frequently must integrate their work wiht engineers, landscapers and wildlife biologists. Salaries of conservation turf managers are generally equivalent to those of Civil Service or other public employer positions.

Grounds Keepers: Careers as grounds keepers are located with universities, state houses, state office buildings, parks and Houses of Congress; but may also be found with hospitals, large industries or private land holders. In these careers, a broad knowledge of turf and landscaping is needed, since shrubs, trees and structures are involved. In most cases, the turf is used for lawns, but may include play areas. The grounds keeper must be a good manager of work crews, budgets and equipment. Scheduling of grounds work to minimize interference with normal institutional activities is critical. Salaries for grounds keepers at large institutions should be equivalent to those of golf course superintendents.

Contractual Turfman: This area of careers has a wide variety of self employment or private enterprise opportunities. Careers may include sod farming and sales; sod sales and installation; lawn grading, topsoiling and seeding; maintenance of existing lawns and shrubs; or total landscaping, including lawns, gardens and shrubs. The contractual turfman or woman owns or leases the needed equipment and supplies, and employs crews as needed. Contracts might be with elderly people, industries, municipalities, new home builders or other contractors as subcontracts. Training in business and the legal aspects of business is needed. At least one career in contractual turf is available for each 10,000 in population. Salaries in contractual turf are determined by the initiative of the individual.

Commercial Careers: As the turf industry grows, so do the employment opportunities with commercial companies who supply the turf user as manager. Commercial careers usually involve sales, demonstration, testing, production and maintenance of turf products and equipment. Sales careers involve fertilizers, seed, sod, pesticides, mowers, soil working equipment, applicators and small tools, such as rakes, hoes and shovels. The seller must be able to accurately evaluate users' needs or demands and limitations of products. Seed and sod producers must meet market demands for turf species and purity. Equipment and chemical suppliers must know what turf cultural needs exist and develop and test their products in line with turf culture requirements. These careers require keeping abreast of turf research and use developments. Training of commercial turf men and women must include depth in business and engineering. Salaries in commercial turf usually have a commission incentive.

Careers in Research and Teaching: Most colleges and universities with agricultural programs usually do turf research and teaching. Teaching programs are also found in some high schools along with horticulture programs. A turf graduate would qualify to teach horticulture as well as high school science courses. Turf seed companies and product suppliers also research their products before they can be marketed. A large number of careers in research and teaching, therefore, can be found. Such careers may exist at the undergraduate level as technicians to higher trained professionals, or as a professional teacher and researcher.

2. Each student will spend one day visiting a local field site where any of the above are employed.
3. Various members of the above professions will visit the classroom for a day to answer questions and describe their work.
4. Various readings will be assigned from the resource list.

EVALUATION

Evaluation procedures will be based upon a satisfactory completion of the Learning Activities described above. Each student should complete a seminar evaluation form.

TIME CONSTRAINTS

At the beginning of the semester, two periods are devoted to an explanation of the various careers listed above, followed by the infusion of career opportunities with the ~~various~~ topics above (See Learning

Activities) over the course of the semester.

RESOURCES

Shertzer, B. Career planning. Boston, MA.: Houghton Mifflin Publishing Co., 1977.

Dictionary of occupational titles. Department of Labor, Washington, D.C.: U.S. Government Printing Office. 1977.

APPLICATIONS OF CAREER EDUCATION IN CIVIL ENGINEERING

George Greenwood

INTRODUCTION

This career education unit is prepared for integration with a senior civil engineering course entitled, "Construction, Engineering and Estimating." It should provide the student with direct contact with practicing professionals in the construction industry and with the opportunity for "hands-on" learning related to one of the basic requirements in the engineering and construction field - construction project estimating.

The vast majority of civil engineering students are involved at some point in the early stages of their career with duties directly related to or closely allied with construction work. However, most already crowded civil engineering curricula have been hard put to provide the student with some meaningful learning experience in recognition of this fact.

GOAL

The overall purpose of the course is to attempt to respond to a need of students in civil engineering to have a meaningful grasp of the overall operations of the construction industry.

This specific career education unit's function within the course is to supply in-depth learning and practice in construction cost estimating, an important segment of construction operation.

OBJECTIVE

The three principles objectives of the unit are:

1. To instruct students in the fundamentals of estimating construction costs through classroom lecture and discussion, and illustration by construction industry professionals.
2. To apply the material presented in the instruction phase in "real world" conditions by assisting in the preparation of a complete set of bid proposal documents for an actual publicly advertised construction project within the appropriate time constraints.
3. To attend, as an observer, the public meeting advertised for the opening of construction bids appropriate to the particular project.

LEARNING ACTIVITIES

The following learning activities, keyed to the above objectives will be implemented at appropriate times throughout the course.

1. The thrust of this activity will be to provide detailed instructions from practicing professionals on the "How to..." of quantity and cost estimating. Four major presentations by practitioners in the construction industry will include information and suggestions on:
   a. initial familiarization with a project,
   b. planning and construction sequence and
   c. quantity take-off and estimating.
2. Armed with the rudiments of construction estimating provided through these accelerated training sessions, the class will organize itself into estimating teams in preparation for estimating and bidding a construction

project as publicly advertised for competitive bidding. Each estimating team will be comprised of from eight to twelve students and the specifics of how they organize their group will obviously vary depending on the type of project selected. However, in all cases, discussions as to the authoritarian structure of the team as well as the manner in which the project is apportioned will be made by the group and be subject to critical self examination after bidding on the project.

Plans and specifications obtained for the construction projects are selected and the team plans its activities to meet the advertised bid opending date. The team assumes complete responsibility for preparing the bid from this point on and the instructor becomes mainly an observer with occasional advising responsibilities. The team must determine the construction procedure, and cost out all material, labor and equipment pertinent to bidding the job. Job and company overhead is assessed to make a realistic bid and the final bid proposal documents are prepared.

3. The final phase of the class effort is the public opening of the project bids. Each estimating team attends the appropriate bid opening but the realism of their work ceases at this point since the bid is not actually submitted. They do, however, record bid item costs for each bid both the low and second bidder where they are publicly read and these costs are used as the yardstick against which they evaluate their effort.

EVALUATION

Each student evaluates his or her own contribution, and each student supervisor evaluates his or her subordinates. The instructor evaluates each individual's performance and the contribution made to the entire team effort. The instructor synthesizes this evaluation and the letter grade thus derived constitutes approximately 20 percent of the course grade. Short examinations given on an unscheduled basis determine the remaining 30 percent of the students final grade.

The proof of the effort in this unit is assessed in the cold light of competition on the open market - the competitive construction bid process. Bid results will be examined, item by item, in comparison with the student estimates to assess both validity of approach and accuracy of results. These findings supplemented by an involvement factor will be reflected in the ratings assigned each individual through his or her self assessment, the evaluation of his/her student leaders and the grading of the course instructor.

TIME CONSTRAINTS

Six weeks provides for a three week instruction period and a realistic two to three week bid preparation time period. The entire six-week segment might be shifted within the course framework to accommodate activity on the bidding market.

RESOURCES

Instructor - representatives from the construction industry

Textbooks, materials, and equipemtn catalogs

Construction plans

Specification and supplier cost information

INFUSING CAREER EDUCATION IN THE SCHOOL OF FOREST RESOURCES

John Litvay

INTRODUCTION

At a recent national meeting of the Society of American Foresters a panel concerned with forestry education discussed "student-faculty contact and counseling and its effects upon career decisions." Background material on trends in forestry education can be found in a recent series of articles in the March 1977 issue of the Journal of Forestry. Some of the pertinent trends and facts are:

1. Enrollments have increased substantially (18,287 in 1972 to 21,757 in 1976).
2. The percentage of enrolled women has increased and accounts for a larger percentage of the total undergraduate class (218% increase in women enrollment which represents 18% of the undergraduate class in 1976, as compared to only 6.7% of the 1972 class).
3. The number of potential professional jobs appears to be approximately 1,000 per year until 1985.

The problem in forestry education has been described as one of supply and demand; there are larger numbers of graduates looking for employment in a field where traditional job opportunities appear to be scarce. At this school, a very large number of students has inundated our present system and led to minimal contact between students and faculty with regards to counseling and/or career education. An even greater problem has been created by the faculty. The response to the scarcity of job opportunities has been to repeatedly warn students that prospects for job placements are poor. The faculty has, in being candid and overly honest with students, preconditioned many to believe that they will fail in "getting a job." However, the "jobs" being defined in the traditional sense are with state and federal forest services, or private forest industries. The result of this has been that students have given minimal attention to acquiring a position, usually only applying for the obvious positions with "obvious employers."

GOALS

In order to alleviate this problem, two things need to be accomplished:

1. A conscious effort at career education should be made throughout the students' forestry education, and
2. The student's attitude towards employment opportunities needs to be changed; an honest and optimistic approach should be undertaken with special emphasis on careers and employment in related or "spin-off" fields of interest.

Because of the large numbers of students which would need to be affected by the infusion of career education into the curriculum, the program should be implemented in those classes which are common to a majority of the students. Common classes are Freshman Orientation, Introduction to Forestry, Summer Camp and Senior Seminar. These courses would also give us some continuity since they deal with first-year students, sophomores and seniors.

OBJECTIVES

A coordinated effort should be made to infuse career education into the forestry curriculum. Each of the above courses should emphasize a certain aspect of the progression which is encountered in career decisions, but the outlook should be optimistic, emphasizing the interrelationships between "typical careers" and related, spin-off careers.

The objectives of this unit are to state the School of Forestry's advisement and career education structure and to identify problem areas which need attention. These recommendations may be the best way to infuse career education into the existing system quickly and at a low cost and in a way in which the benefits will be measurable and significant. The unit by Canavera is an excellent example of career education infusion.

In my opinion, the School of Forestry produces a student with marketable skills. The biggest problem we need to address is caused by pre-conditioning our students to expect and accept the inability to obtain a job in the "traditional markets" as a failure. Career education may be the vehicle to address this issue.

LEARNING ACTIVITIES

A program should be implemented which allows the student to answer the following value questions:

Who am I?

Do I really know what forestry is?

Is forestry really the right career field for me?

"Introduction to Forestry"

The overall objective of this course is to serve as an introduction to the various fields of study in forestry. It consists of a series of lectures and labs conducted by various experts in each of the various fields of study. The best way to infuse career education into this level would be to have each instructor of the course devote five to ten minutes of their lecture time to career possibilities and/or case histories, with special emphasis on spin-off and related job opportunities.

At the end of the semester one lecture lab may be devoted entirely to career education. It would serve to consolidate and focus all the previous bits of career information they have received. The lab would be devoted to the design and creation of job clusters for each student's interest.

Summer Camp

Because the students are in the field most of the day, it is proposed that the evening seminar series be used for infusion of career education. The main emphasis should be on bringing together the students and successful business persons, especially those with forestry training who are in non-traditional employments.

Senior Seminar

Because the students in this class are last semester seniors, the goal of this course should be largely informational. Five to ten minutes at the start of each class should be devoted to announcing all current job openings and/or interviews to the class. The emphasis here should be on all of the possible job opportunities available. The five to ten minute announcements continue until the end of the semester.

EVALUATION

It is suggested that a self-report format questionnaire be used to elicit input from the students concerning this unit at the beginning of its implementation.

TIME CONSTRAINTS

The philosophy and practices of career education are to be integrated over a four-year training program.

RESOURCES

1. General:

   Employment Outlook: Conservation Occupations. U.S. Department of Labor, 1970, 10 pgs.

   Forester. Chronical Guidance Publications, inc., 1971.

   Hall, L. G. Hall Occupational Orientation Inventory - College Form. Chicago: Follett Educational Corporation, 1965.

A CAREER-ORIENTED SEMINAR FOR THE ELECTRICAL ENGINEERING CURRICULUM

Sydney B. Newell

INTRODUCTION

Electrical engineering is a curriculum for which there is a sizeable and well-defined job market. Yet many students elect a major in electrical engineering with only a vague impression of the actual work a graduate might be hired to do. For many students, the choice of an electrical engineering major is based on fantasy, emotion, conjecture, or family history. Thus, in electrical engineering, the implications of career education lie not so much in recruiting students, but in obtaining the right students--students who have a concrete knowledge of the job market and who have the aptitude, personality and ability that would make them compatible with a career in electrical engineering.

During the first two years of the electrical engineering program, a large amount of attrition occurs, as students find out that a) they don't like the curriculum, or b) they can't make the grade. The students that remain after the first two years are probably well-suited to the electrical engineering curriculum, or at least to one in science or engineering as expected. Thus, it is at the beginning of the junior year that specific and detailed career education becomes important.

This material describes a seminar, to be required during the junior and senior years of the electrical engineering curriculum. The seminar, to be held once weekly on a semester basis, will provide specific information on career opportunities, skills needed in special areas, and job-seeking instruction. The students will have an opportunity to assess their own values and interests while the time is ripe for them to elect courses that will give their electrical engineering degree a unique and specific thrust.

GOALS

The goals of the seminar are listed below.

1. To help students to identify "what an electrical engineer does" in as many specialized areas as possible, and the specific skills needed for each specialty.
2. To help students assess their own interests and values in order to determine an appropriate area of specialization.
3. To aid students in the choice of elective courses to strengthen their chosen areas of specialization and give them needed skills.
4. To cause students to reassess their decision to become electrical engineers, on the basis of the more detailed information that is to be provided, and to help them change to a more suitable curriculum if their original decision is inconsistent with their interests and aptitudes.
5. To help students know what employers and recruiters are looking for in job applicants, and to give them skills that will allow them to present themselves to prospective employers in the best possible way.

OBJECTIVES

After participating in the seminar, students should be able to:

1. Identify their reasons for choosing to major in electrical engineering, and either confirm or deny the validity of the decision. If the latter, then they should be able to choose another curriculum.

2. Identify specialized job areas in electrical engineering and describe their specific requirements, duties, and necessary skills.
3. Identify their own preferences in terms of specialized job areas.
4. Choose appropriate elective courses based on job areas of interest.
5. Identify some specific things that can be done to make a better impression on a prospective employer, both in terms of the resume and of the interview.
6. Prepare job applications that present time in the most favorable light.
7. Make a decision as to whether to take a job upon graduation or to continue graduate-level education.
8. Make a decision as to which job or which graduate school to select.

LEARNING ACTIVITIES

Since the material that is proposed is designed as a seminar course, most of the learning activities will take place in a seminar format. At the beginning of each semester, the first three seminars could be built around the following topics:

Topic 1: Career Trends in Electrical Engineering

An overview of occupational and training trends in the engineering field will comprise the essential content of this session.

Topic 2: Self Analysis and Future Planning

The focus of this session will be to assist each student in identifying personal interests, goals and career plans in relation to occupational needs in engineering.

Topic 3: Technological Changes and Their Impact on Electrical Engineering

The purpose of this session will be to investigate the role of scientific development and potential impacts on the preparation of engineers.

For the remainder of the semester, guest speakers and panels will constitute a major portion of the seminar. The above topics will be supplemented by the use of:

1. Guest Speakers:
    a. Academic Personnel - Faculty members, from UMO or other universities, will describe academic life and its requirements.
    b. Industrial Personnel - Speakers from industry will be invited to describe electrical engineering activities at their specific places of business.
    c. Recent UMO graduates in electrical engineering--UMO graduates of the electrical engineering program of the past two years will be invited to return and describe "a day in the life" of their current occupation, whether it is in graduate school or in an industrial job. The graduates would be asked to list those courses which were most helpful in their current occupation - courses that were inappropriate and courses that they wish they had taken.
    d. UMO students in electrical engineering who are participating in the Co-op program will be asked to describe their activities and impressions as in (c).

e. Recruiters from Industry - Personnel from private industries, on campus for the purpose of recruiting employees for their companies, will be asked to describe any or all of the following: 1) how to prepare a resume; 2) how to write a letter of application; 3) what the interviewer looks for in a prospective employee; 4) how to dress and conduct oneself for an interview; and 5) the specific job requirements for the company being represented. This will benefit the recruiters as well as the students, since the recruiters will have a "captive audience" of all of the eligible electrical engineering students.

2. Panels:

At various times, panels will be arranged that include representatives from several specialized areas of electrical engineering. Student questions will be invited, and comparisons among the various areas may be made. Pro and con agruments will be invited. In this way, students can acquire first-hand answers to their career questions.

3. Field Trips

Field trips should be planned, so that students can observe actual work situations in one or more specialized areas of electrical engineering.

4. Report Writing:

From time to time, students should be required to write a status report which should include: a) a listing and description of as many specialized fields of electrical engineering as possible learned since the last report was submitted; b) a listing of the requirements of each; c) an enumeration of their interests, values, abilities, or skills and an assessment of their own suitability for each job type based on these interests, and so on; d) a listing of job application pointers they have gained since the last report; and e) a statement of their current career plans, with specific reasons wherever possible.

EVALUATION

In order to determine how well the objectives of the seminar are being met, the following evaluation procedures will be followed:

1. At the beginning of each semester, students should write a description of their Self Knowledge (interests, abilities, aptitudes) and any Career Knowledge.
2. During the course of the seminar, the reports described in Learning Activities, Part 4, will be compared with the initial descriptions just mentioned. In this way, a precise assessment of student gains in Self Knowledge and in Career Knowledge can be achieved.
3. Students will write a Self Report that describes their career concerns and decision plans. This report will be submitted at the end of each semester.

TIME CONSTRAINTS

It is suggested that this seminar be presented for one hour each week each semester, for a total of 15 hours per semester. This would be required for each of the junior and senior years, so that each student would receive a total of 60 hours of the seminar prior to graduation.

RESOURCES

1. Speakers and Panel Members:
   - a. Members of electrical engineering faculty at UMO.
   - b. Members of electrical engineering faculty at other universities (to be recruited through personal friendships with UMO faculty).
   - c. Representatives from local industry (to be recruited on the basis of fostering good industry-university relationships).
   - d. Other representatives from industry (to be obtained through personal friendships as in b).
   - e. Recent UMO graduates (who will participate from a sense of loyalty).
   - f. Student members of UMO Co-Op program.
   - g. Recruiters from industries (who will be on campus anyway).
2. Literature:
   - a. Graduate school catalog.
   - b. Descriptive materials from specific industries (provided by guest speakers or obtained directly from the industries).
   - c. Occupational outlook handbook. Washington, D.C.: U.S. Department of Labor, Bureau of Labor Statistics, 1976-77.
   - d. Selected statistical notes on American education. Washington, D.C.: Office of Education, 1974.
3. Student chapter of IEEE at UMO. This organization can provide some help with regard to getting speakers, organizing field trips, etc.

4. Course descriptions in UMO catalog, and teachers who teach them could give more detailed accounts of each course's content.

APPLICATIONS OF CAREER EDUCATION IN SECONDARY SOCIAL STUDIES EDUCATION

Anne E. Pooler

INTRODUCTION

Individualistic goals of career education are to make work (a) possible, (b) meaningful, and (c) satisfying for each individual (Ryan, 1978). Individuals must accept the responsibility for their own unique career pattern. This pattern should be based upon rational decision-making skills, a major component of which is the ability to think critically.

The process of thinking can be taught. Frequently, secondary teachers assume that all the skills which may be acquired have been refined by the time a student reaches high school. When lessons are planned then, most of the emphasis is based on content to be used and teaching style to be employed, with a limited amount of conscious effort to ordering instruction which develops critical thinking skills. These skills are of paramount importance if students are to accept responsibility for their career decision-making processes.

This unit serves the dual function of instructing potential secondary social studies teachers about a process of critical thinking and introduces career education which serves as the vehicle.

GOALS

A primary goal of this unit is to acquaint potential secondary social studies teachers with an understanding of career education. A secondary goal is to instruct the student in using small-group techniques in the classroom, questioning techniques and personal interviews.

OBJECTIVES

Students will:

1. demonstrate a knowledge of career education by defining it in a class discussion and/or by a written exercise.
2. evaluate the use of small group work by completing a small group checklist.
3. analyze the techniques of teaching thinking skills by constructing a series of questions.
4. evaluate their personal commitment to a career in education by comparing it with a taped interview of a practicing professional.

LEARNING ACTIVITIES

Activity 1:

Administer the Ym form of the Watson-Glaser Critical Thinking Appraisal.

Activity 2:

a. Divide the class into small groups and have each group write a definition of career education.
b. Ask each group to designate a student to write on the board the group's definition of career education.
c. Conduct a general discussion of the different meanings that the groups came up with as to the meaning of career education.
d. Extract the common elements and try to arrive at a class consensus as to the meaning of career education.
e. Compare the responses of the class to the generic definition(s): "Career" as the totality of work one does in his or her lifetime, and "Education" as the totality of experiences through which one learns.

f. Analyze the pros and cons of small group work as an instructional technique with such questions as: Did the group make a decision? How did members share information, clarify ideas? What problems should the group work on?

Activity 3:

a. Write the following list on the board which contains partial descriptions of the current assumptions underlying the career education concept:

(1) spans the entire life cycle
(2) productivity
(3) work--paid and non-paid
(4) volunteerism and leisure time
(5) multiplicity of work values
(6) developmental
(7) for all persons
(8) acquire skills
(9) job satisfaction
(10) socially beneficial

b. Lead the students through a carefully planned sequence of questions which takes them from the conceptual (lower level) to the evaluation (higher level) stage of thinking:

(1) Conceptualizing
 (a) What can we make out of all this information?
 (b) How else may you group portions of this information?
  Example: AFFECTIVE ELEMENT
  job satisfaction, socially beneficial, multiplicity of work values

(2) Interpreting

(a) Summarize what was said

(b) What is the purpose of including volunteerism and leisure time in the concept of career education?

(3) Analyzing

(a) "If people engage in work that is satisfying, then this will be beneficial to society."
Is this a testable hypothesis?

(4) Generalizing

(a) Are there some generalizations we can make from these instances about career education?

(b) Propose several hypotheses.

(5) Applying

Stewart Wells has worked for 25 years lifting 1500 manhole-cover-size steel pieces on and off his grinding machine daily. He recently stated he would rather be doing something easier and cleaner but didn't know where he could make the same money.

(a) Does Mr. Wells' job fit the concept of "career"?

(6) Evaluating

(a) By what standards or values are you judging your decision in Mr. Wells' case?

(b) If a worker is well-paid for performing a monotonous task, but he is not personally satisfied, it should be the responsibility of the employing company to implement strategies for job satisfaction. Do you agree or disagree? Upon what values are you basing this position?

(c) Have the students analyze each question you asked and discuss the level of thinking required at each level. Assign Chapter 2, "Skills in Thinking," by Jean Fair in the National Council of Social Studies 47th Yearbook, Developing Decision-Making Skills.

Activity 4:

a. Have each student develop questions for an interview based upon the preceding process.

b. Each student will tape an interview with a professional, such as a history teacher or principal. This activity will provide the student with first-hand knowledge about the profession and will enable the individual to analyze his or her own position in the field.

Activity 5:

Administer the Zm Form of the Watson-Glaser Critical Thinking Appraisal.

EVALUATION

It is suggested that the instructor develop an observation checklist to record each individual's participation in class. The interview tapes will be evaluated according to the order and level of questions asked. The Watson-Glaser pre- and post-test Critical Thinking Appraisal Inventory may determine a change in thinking skills.

TIME CONSTRAINTS

This unit requires approximately five 90-minute class periods.

RESOURCES

1. Assessment Instrument:

Watson, G. and Glaser, E. M. Forms Ym and Zm: Watson-Glaser Critical Thinking Appraisal. New York: Harcourt Brace Jovanovich, 1964.

2. Books:

Baird, Susan E. Career education and social studies. Guidance Monograph Series IX: Career Education Curriculum, 1975.

Kurfman, D. G. (ed.) Developing decision-making skills, 47th Yearbook of the National Council for the Social Studies, 1977.

Ryan, C. W. Career education in higher education monograph, Volumes II and III, 1978.

3. Instructional Resources:

Resource persons, such as teachers, principals and other educational personnel.

Resource notebook developed for use in the Career Education Seminars for University Personnel at the University of Maine at Orono, 1977.

APPLICATION OF CAREER EDUCATION THROUGH ACADEMIC ADVISING IN THE SCHOOL OF FOREST RESOURCES

Craig E. Shuler

INTRODUCTION

The School of Forest Resources is a professional school with academic programs in forestry, wood technology, and wildlife. The curricula have a history of extensive laboratory courses, field work, field trips and summer camp experiences to emphasize practical and realisitc career situations. So the question is not whether or not to have career education, but rather, whether or not what is being done is sufficient and/or effective. The fact that there are instances of questions about careers and apathy toward course work are general indications that alternatives might be explored.

It appears that the academic programs provide a suitable mixture of the necessary knowledge, skills, and values for the professional aspects of these fields yet there is limited opportunity within the boundaries of a curriculum for an individual to consciously consider personal capabilities and values. These factors do not necessarily curtail one's professional achievement but may significantly affect one's quality of life. The addition of new courses and/or course materials for this purpose could be done only with the unacceptable trade-off of reducing the amount of technical course work. Thus a new process has been devised in which career education may be infused through the registration advising system. A secondary result may be better organization of advising procedures, a reduction in repetition, and additional time to deal with each individual's specific program needs.

GOALS

The goal of this procedure is to enable students to identify how their personal goals and characteristics correspond to the requirements of their proposed career field. Three specific goals are:

1. To increase awareness of the relationship between career objectives and forestry opportunities.
2. To confront the individual with the need to better understand his/her personal characteristics and demands of the various forestry career fields.
3. To discuss philosophical and ethical aspects of the forestry profession.

OBJECTIVES

Attainment of the goals will be attempted through periodic tasks which are consistent with the level of academic development to that time. These tasks consist of questionnaires which will be completed in conjunction with the pre-registration process. Most of the activities will be initiated in a group setting with a mixture of ages, but some one-to-one discussion will be necessary and important for evaluation and curriculum development. The objectives are:

1. To assist each student in identifying career goals in Forestry that are consistent with their interests and abilities.
2. To assist each student in identifying ethical and philosophical issues related to the forestry profession and to compare these with their values or beliefs.
3. To revise the student advising process in order to ensure one session per semester is devoted to career awareness for each student.

LEARNING ACTIVITIES

One key element will be getting all advisees together for at least one hour in the week prior to preregistration. At that time the preregistration instructions may be explained all at once, rather than to each individual. The instructions will then be given for the questionnaires (see schedule below). Group discussions will be encouraged in order for the various developmental levels to share items of a particular concern.

It should be emphasized that each questionnaire must be filled out before the preregistration will be completed. Before signing the registration cards, the advisor will discuss with each student how the questionnaire relates to their academic program and career objectives. Since the mechanics or registration have already been explained, more time can be spent with an individual's program and specific needs.

Ideally, this system should include incoming freshman students as well as those students already on campus. Although not all incoming freshman attend, freshmen orientation is the logical place to initially relate career objectives and academic programs. It may also be worthwhile to include the parents who attend freshmen orientation.

The following schedule indicates which activity will be used with each class:

Suggested Discussion Topics

	FR.	SO.	JR.	SR.
Freshman Orientation	Topic 1: Is this really necessary?	▨	▨	▨
Fall Semester	Activity 1: Self Appraisal	Activity 2: Optimum Person & Career	Topic 4: Satisfaction Profile	Topic 5: Skill Needs & Develop Evaluation
Spring Semester	Topic 2: Concepts of Work	Topic 3: Curriculum and knowledge, Skills & Values	Activity 3: Self-Appraisal & Work Milieu	▨

Samples of materials are attached at the end of this unit.

This process will require 1-2 hours each semester and during each freshman orientation session. Additional time may be required for students to complete or evaluate the exercises. Evaluation of the process will be accomplished in the fall semester of the senior year. Interim subjective evaluations can be made by the advisor through student feedback, changes in the number and type of scheduling problems, and changes in student interests and/or career goals.

Activity 1: In the fall semester have each entering freshman complete the following instruments:

a. Self-Appraisal-My Personality (HO 2)

b. Commitment and Plans (Exercise 1)

Activity 2: Have the students read and be prepared to discuss HO 1, "Optimum Person" prior to the freshman orientation. Divide the students into groups of 10 to 12 and use faculty and/or graduate assistants as discussion leaders.

Each of these instruments is designed to improve the self-awareness, career planning and decision-making skills of each student. Plan discussion sessions similiar to those in Activity 2 to help students clarify concerns.

Activity 3: Have each student in his or her sophomore or junior year, visit a work setting in order to observe a forest technologist at work - use HO 3 "Observations of the Work Milieu" as a guide in this exercise.

EVALUATION

1. The student(s) will be provided with an evaluation form in the senior year to provide comments on the career advising process and specific reactions in relation to their chosen plans.

2. Each student will be asked to complete a career implementation plan and identify one or more factors that facilitated his/her career development during the last four years.

TIME CONSTRAINTS

The process is geared to be used over a four-year period.

RESOURCES

1. Instructional Resources:

Handout 1 - "Optimum Person" reading material.

Handout 2 - "Self-Appraisal-My Personality" - an exercise for student use.

Handout 3 - "Observations of the Work Milieu" - a guide for conducting a job analysis.

Exercise 1 - Commitment analysis for student use.

Book:

Maslow, A. H. *Toward a psychology of being*. (2nd. ed.) New York: Litton Educational Publishing, Inc., 1968.

HANDOUT 1

Optimum Persons

Abraham Maslow

1. MORE EFFICIENT PERCEPTION OF REALITY AND MORE COMFORTABLE RELATIONS WITH IT.

   Ability to detect the spurious, the fake, and the dishonest. Tuned more to the real world of nature than the man-made mass of concepts, abstractions, expectations, beliefs, and stereotypes that most people confuse with the world. Unthreatened and unfrightened by the unknown; comfortable with it. Able to live with doubt, uncertainty, and tentativeness. Not only tolerant of the ambiguous and unstructured, but liking it.

2. ACCEPTANCE (SELF, OTHERS, NATURE).

   Ability to accept selves and own nature without chagrin or complaint. Accept and enjoy selves on the animal level: appetite, sleep, sex. Lacking in defensiveness, pose, and protective coloration. Lacking in cant, guile, hypocrisy, front, face, game-playing, trying to impress others.

3. SPONTANIETY.

   Spontaneous in behavior, inner life, thoughts, impulses. Simple natural reactions. Do not allow convention to hamper or inhibit from doing anything that is considered very important or basic.

4. PROBLEM-CENTERING.

   Strongly focus on problems outside selves. Concerned with ethical and philosophical questions. Have a framework that is broad and universal, not petty and local.

5. THE QUALITY OF DETACHMENT: THE NEED FOR PRIVACY.

   Can tolerate, even enjoy solitude. Remain detached and undisturbed in situations that upset others. Are more objective. Able to concentrate and therefore become absent-minded and oblivious of surroundings.

6. AUTONOMY: INDEPENDENCE OF CULTURE AND ENVIRONMENT

   Are independent of other people and the culture for satisfaction. Find satisfactions intrinsically, rather than extrinsically. Remain independent of hard knocks, deprivations.

7. CONTINUED FRESHNESS OF APPRECIATION.

   Able to appreciate again and again, freshly and naively, the basic goodness of life with awe, pleasure, wonder, and even ecstasy. Various experiences provide these moments of appreciation--nature, children, music -- but they come from things natural, not from money or material things.

8. GEMEINSCHAFTSGEFUHL. (SOCIAL INTEREST)

A deep feeling of identification, sympathy, and affection for human beings in general in spite of occasional anger, impatience, or disgust. A genuine desire to help the human race.

9. INTERPERSONAL RELATIONS.

Deep and profound interpersonal relations. Closer, more perfect, deeper identification. Yet with fewer individuals. Especially tender love toward children.

10. THE DEMOCRATIC CHARACTER STRUCTURE.

Friendly with everyone of suitable character regardless of class, education, political belief, race or color. Unaware of superficial differences. Willing to learn from anyone. Humble and respectful before those who have something to teach. Give respect to every human just because he/she is human.

11. DISCRIMINATION BETWEEN MEANS AND ENDS.

Are certain about right and wrong, have definite moral standards, are strongly ethical; but not in a conventional sense. Generally are concerned more with ends than means, though they are able to convert means into ends by becoming involved in the processes.

12. PHILOSOPHICAL, UNHOSTILE SENSE OF HUMOR.

Find nothing laughable in humor based on hostility, superiority, or authority-rebellion. Humor is based on what is thoughtful, philosophical, and spontaneous rather than on punning, witty remarks, or gay repartee.

13. CREATIVENESS.

A universal characteristic. Not genius creativity, but like the naive and universal creativeness of unspoiled children. Less inhibited, less constricted, less bound.

14. RESISTANCE TO ENCULTURATION.

Have a calm, long-time concern with cultural improvement that recognizes both the slowness and necessity of change. Can work for quick change when necessary though. Were pugnacious, impatient, and eager in their youth but have learned to temper their optimism. Are ruled by the laws of their own character rather than by the culture.

15. THE IMPERFECTIONS OF SELF-ACTUALIZING PEOPLE.

Possess plenty of the lesser human failings: vanity, partiality. temper outbursts, bad habits, ruthlessness, independence to the point of estrangement from others, impersonal, unsocial.

16. VALUES AND SELF-ACTUALIZATION

Strength of personality provides a basis for the creation of own values. Fundamentally differing perceptions result in unconventional values.

17. THE RESOLUTION OF DICHOTOMIES IN SELF-ACTUALIZATION.

See self as a single whole, rather than as split into warring entities such as mind/body, heart/head, work/play, mature/childlike, sobriety/humor, self/society, acceptance/rebellion. See the world in wholes and as multifacted rather than as polarized.

Source: Maslow, A. Eupsychian Management: A Journal. Homewood, IL.: Irwin, Inc. and Dorsey Press, 1965.

HANDOUT 2

Self-Appraisal - My Personality

Using the symbols listed below, determine the degree of each quality that you now possess, would like to possess, and that someone else thinks you possess.

1. never or need improvement 2. seldom or fair 3. often or good
4. always or excellent

In the first column, write the number that best describes how you now see yourself. In the second column, write the number that best describes your "ideal self," the degree to which you would like to possess each quality.

	As I am now	As I would like to be	As others see me
A. APPEARANCE (showing self-pride)			
1. Health...............			
2. Posture..............			
3. Grooming.............			
4. Facial Expressions...			
B. MANNERS			
1. Concern for others...			
2. Observance of etiquette............			
3. Compliments others...			
C. EXPRESSIONS, COMMUNICATION			
1. Voice quality........			
2. Correctness of English usage........			
3. Pronunciation........			
4. Shows feeling or intentions...........			
5. Openness.............			
D. PERSONAL TRAITS			
1. Ambitious............			
2. Annoying.............			
3. Calm.................			
4. Competent............			
5. Confident............			
6. Considerate..........			
7. Dependable...........			
8. Efficient............			
9. Faultfinding.........			
10. Helpful..............			

Source: Adapted form Carney, C. & Streufert, D. Exercises in Career Planning and Career Development. Ohio State University, N.D.

HANDOUT 3

Observations of the Work Milieu

I. Work Setting

- A. Name and address of employer
- B. Products or services
- C. Occupational title or position

II. Physical Features of the Work Environment

- A. Transportation to and from the job
- B. Travel requirements
- C. Mobility on the job
  - 1. Location of parking lot, access to buildings
  - 2. Location and attractiveness of cafeteria, washrooms and fire exists
  - 3. Space for movement
- D. Lighting, heat, humidity, ventilation
- E. Sanitation, orderliness
- F. Noise, vibration
- G. Health and accident hazards
- H. Other physical features

III. Psychosocial Features of the Environment

- A. Characteristics of employees
  - 1. Predominant age range
  - 2. Male vs. Female
  - 3. Minority group members
  - 4. Informal leader traits
  - 5. Professional (vocational) interests
  - 6. Recreational interests
- B. Interpersonal relations
  - 1. Isolated task vs. joint operation of team work cooperation required
  - 2. Opportunity for conversation during week.
  - 3. Close vs. occasional supervision
  - 4. Supervisor expectations
  - 5. Socialization outside of work
- C. Other psychosocial features

IV. Physical Demands of Work Performed

- A. Sitting vs. standing
- B. Stamina required
- C. Visual acuity
- D. Color vision
- E. Agility or coordination
- F. Finger dexterity
- G. Strength required
- H. Other physical demands

Source: A Resource Guide for Career Development in the Senior High School. Minnesota Department of Education, 1973.

V. Psychological Demands of Work Performed

- A. Range of intelligence
- B. Memory needed
- C. Creativity needed
- D. Precision and other pressures
- E. Repetitive vs. variety
- F. Adaptability to change
- G. Stress of uncertainty or novelity
- H. Other psychological demands

VI. Psychological Rewards of Work Performed

- A. Autonomy, freedom of behavior
- B. Responsibility vs. lack of responsibility
- C. Exercise of initiative, judgment, creativity
- D. Direct or indirect service to others
- E. Helping with problems of our society
- F. Other psychological rewards

EXERCISE 1

AWARENESS -

EXPLORATION -

COMMITMENT:

Commitments that are firm right now:

Commitments I am ready to let go:

Commitments I am ready to add:

Commitments others want me to make:

SKILL DEVELOPMENT -

SKILL REFINEMENT -

REAFFIRMATION/REDIRECTION -

Developed by Joseph Quaranta, College of Education, Ohio State University, Columbus, Ohio, N.D.

APPLICATION OF CAREER EDUCATION IN MATERIALS ENGINEERING

Hayden M. Soule

INTRODUCTION

A study of engineeering materials cuts across all engineering lines. Whether Agricultural, Mechanical, Civil or Electrical, all engineers must have a knowledge of materials properties and characteristics. Therefore, this course which crosses many career lines makes an excellent setting for the infusion of career education into the regular curriculum of engineering students.

Engineering students are commonly expected to have their career goals well thought-out. However, the opposite is usually true. Many students enter a study of engineering because they like to tinker, because "Dad" was an engineer or other equally tenuous reasons. When faced with a close-up view of the engineering profession, many waiver in their resolve and seek other lines. It is for these students as well as the committed student that this unit is designed.

Activities are planned to provide students with information about careers in technology, to arrange encounters between students and individuals working in engineering and related fields and to provide students with hands-on experiences in the world of work. As a result, students should develop a more realistic view of their chosen careers. This will either reinforce their career decisions or promote career-change decisions early in their college experience.

GOALS

The overall goals designed to assist the process of career-awareness in the engineering student are:

1. To help the student become more aware of the nature of his or her chosen career.
2. To make the student aware of the personal characteristics required for a successful career in engineering.
3. To demonstrate the relevance of engineering education at the University of Maine at Orono to several career options in engineering.

OBJECTIVES

The students in this unit will:

1. Perform a self-evaluation to determine their interests, abilities and strengths as individuals.
2. Investigate career fields within engineering.
3. Determine entry requirements for specific engineering fields.
4. Develop and employ decision-making skills.
5. Identify specific careers within their chosen profession.
6. Perform typical tasks from one or more career fields.

LEARNING ACTIVITIES

1. The student will complete the following assessment instruments:
   a) Strong-Campbell Interest Inventory
   b) Personality Self-Appraisal
2. The student will interview an engineer working in some field of interest to the student. A career interview guide will be used (See HO 2 of Buck unit, pg.40).
3. Several engineers will discuss their work in class. An attempt will be made to have one of these persons be a recent graduate of the program.

4. Discussion sessions will be held on subjects such as the decision-making process, factors in selecting a work career, performing a career interview, and how to write a career investigation report.
5. Students will solve several problems typical of those found in engineering fields. These will be as realistic as possible and will include case studies.

EVALUATION:

1. Each student will write a career investigation report on at least one of the outside resource persons who speak in class. In this report the student will identify the characteristics of an individual which are strengths or weaknesses in the performance of that job.
2. Each student will give a brief oral report to the class on the results of their career interview. Personal characteristics of the interviewee will be discussed which are particularly suited to the person's occupation.
3. Each student will write an autobiographical essay choosing some of their personal characteristics and how they will relate to his or her chosen career.
4. Problem solutions will be evaluated and discussed.

TIME CONSTRAINTS

This unit will require all or part of ten 50-minute periods.

RESOURCES

1. Assessment Instruments:

   Strong-Campbell Interest Inventory. Palo Alto, CA.: Consulting Psychologist Press, 1976.

   Self-Appraisal - My Personality. Guide to self-evaluation handout in career education seminar (See Shuler unit, pg. 109).

2. Instructional Resources:

   Career Counseling Center Staff - UMO

   Engineers working in the community

3. Handouts:

   R. A. Ristau, "Factors in Selecting Your Work Career."

   R. A. Ristau, "A Career Investigation Report."

   R. A. Ristau, "A Career Interview Guide." (See pg. 40)

   Anonymous, "The Decision-Making Process."

   NOTE: Due to space limitations only one of the referenced HO's is presented).

CAREER EDUCATION FOR STUDENTS IN LAND USE PLANNING

Greg White

INTRODUCTION

The course, "Land Use Planning," is part of the required curriculum for three programs in the College of Life Sciences and Agriculture, and is an accepted elective for several others. It is the only course currently available dealing with the overall principles and practices of land use planning. The course is intended to orient the layperson and para-professional to concepts, terminology, and techniques and is not intended to prepare the student as a professional planner.

Student interest in the course is quite high and surveys of students usually indicate that several of them think they would like to pursue a career in this area. At the present time, these students do not have information to help them evaluate what types of opportunities are available to them in this field given their present academic background and what opportunities exist for further professional training. Secondly, they need help in evaluating their own interests and values, and in considering whether various career opportunities are likely to lead to personal satisfaction or conflict.

Since many of the students enrolled have no interest in exploring career opportunities in the land use planning field, they will continue to pursue term projects and papers as part of the traditional course requirements. As an option, interested students may waive the term project to participate in the following unit to improve their career awareness and self-evaluation.

GOALS

The application of this unit is intended to help the students identify their interests and values. Secondly, by increasing the students' awareness of career opportunities and expectations they will be more capable of making choices which successfully match their own interests and capabilities with the career opportunities. Presumably the range of choice includes employment in a paraprofessional, or trainee position, further education at another institution leading toward a specialized career as a planning professional, or elimination of the land use planning field as a career option.

OBJECTIVES

The students will:

1. Identify their perceptions of their own strengths, weaknesses, interests and values.
2. Investigate career fields and occupations at the state, regional, and local levels.
3. Determine entry-level skills for at least one (1) position in each of the three governmental levels.
4. Employ decision-making skills.

LEARNING ACTIVITIES

1. By the end of the third week of the semester, each participant will take the Strong-Campbell Interest Inventory (SVIB) and will have the results interpreted by qualified Counseling Center personnel. They will then apply this information by preparing a written self-analysis report and statement of career goals.

2. Utilizing instructor-prepared materials as well as existing published material, the participants will study organizational structure, statement of mission and goals, and published planning documents representative of local governments, regional planning commissions, and state land and resource management agencies.

   They will make contact with at least one person currently employed in a planning position for each governmental level.

   By the end of the tenth week of the semester, the participants will prepare a report based primarily on information gathered from the above field contacts. The report will address the following:

   a. identification of the agencies/individuals contacted;
   b. significant similarities and differences of the mission and goals of each;
   c. range of occupational opportunities for planners in each;
   d. perceptions of the expected working environment in each; and
   e. identification of entry-level requirements.

   These papers will be presented and discussed by the participants at a specially scheduled session.

3. Weeks ten (10) through twelve (12) are available for participants to redirect their occupational investigation with respect to questions raised by the instructor or other participants during his or her presentation.

4. Prior to the end of the semester the participants will prepare a written report for themselves and the instructor. This report will summarize the relevant aspects of the individual's self-evaluation and occupational awareness gained from his or her own investigation and information shared at the group session. They will then compare their own abilities and goals with the occupational opportunities and prepare a statement of their immediate occupational goals and steps for attaining them.

EVALUATION

Students will be evaluated on the basis of participation in the group session and written reports. The program itself will be evaluated by the students in a manner similar to student class evaluation.

TIME CONSTRAINTS

Implementation of this unit will require an additional one-and-a-half to three-hour special group session. For the students, participation is expected to require approximately the same time commitment as the waived term project.

RESOURCES

1. Assessment Instruments:
   Strong-Campbell Interest Inventory. Palo Alto, CA.: Consulting Psychologists Press, 1976.
2. Instructional Resources:
   Educational and professional resource individuals
   State, regional and local environmental planning agencies
3. Published Material:
   Maine Directory of Natural Resource Organizations. Augusta: State Planning Office, 1977.
   Annual Reports, Organizational Charts, Planning Documents, etc. as appropriate.

AWARENESS OF MATH USAGE IN CAREERS FOR THE ELEMENTARY TEACHER

Bernard R. Yvon

INTRODUCTION

It is a fact that many, indeed most, elementary schoolage children are not aware of the role mathematics plays in typical adult careers. It is also true that many elementary-age school children do not see the value or benefit of studying mathematics throughout their educational years. These two facts will not change unless conscious efforts by elementary school teachers are made to remedy them.

The purpose of this unit is to assist potential elementary school teachers in developing instructional plans that help elementary school age children study the importance of and necessity for mathematics, particularly as it relates to adult career choices.

GOAL

Students enrolled in "The Teaching of Arithmetic in the Elementary School" will develop an instructional unit appropriate for use with elementary-age students at a grade level of their choice. The purpose of this unit will be to make each elementary child in that grade aware of the importance and role of mathematics in at least one career of their choice.

OBJECTIVE

Each student will develop a unit plan appropriate to help elementary-age children understand and describe the need and use of mathematics in at least one occupational field.

LEARNING ACTIVITIES

The student will research and identify career education literature, materials and resources appropriate for use with elementary-age children.

It will be necessary to introduce the eight career education elements and the philosophy of this concept in several sessions. The eight elements are:

Element 1. Career Awareness (knowledge of the total spectrum of careers).

Outcome Career Identity (role or roles within the world of work)

Element 2. Self-Awareness (knowledge of the components that make up self)

Outcome Self-Identity (knowledge of self - consistent value system)

Element 3. Appreciations and Attitudes (life roles, feeling toward self and others, in respect to society and economics)

Outcome Self/Social Fulfillment (active work roles, satisfying work role)

Element 4. Decision-Making Skills (applying information to rational processes to reach decisions)

Outcome Career Decisions (has a career direction and a plan for career development)

Element 5. Economic Awareness (perceiving processes in production, distribution and consumption)

Outcome Economic Understanding (solve personal and social problems in an economic environment)

Element 6. Beginning Competencies (skills by which a person extends his or her behaviors.

Outcome Employment Skills (competence in performance of job-related tasks)

Element 7. Employability Skills (social and communication skills necessary for career placement and advancement)

Outcome Career Placement (employment in line with career development plan)

Element 8. Educational Awareness (perceiving the relationship between education and life roles)

Outcome Educational Identity (ability to select educational avenues to develop career plans)

Career education in the public school may be developed through the eight basic elements or themes. The elements may be infused into subject matter and may also be used as the basis for the guidance program. In both cases these elements will be developed through awareness, orientation/exploration, and preparation/experience stages in a manner appropriate to both the career selection experiences and the developmental stages of the students. Each student should be provided materials that discuss the philosophy, concepts, and practices of career education. Particular emphasis will be placed on the identification of mathematics requirements and its use in various careers. See pg. 15-17 for suggested unit format.

EVALUATION

The appropriateness of the unit plans will be evaluated by the instructor for: content, procedures and resources as part of the course requirements. Each unit must have at least one career education element correctly identified and related to a mathematics instructional procedure.

TIME CONSTRAINTS

The students will need to develop the plan during the semester in which they are enrolled in the course "The Teaching of Arithmetic in the Elementary School."

RESOURCES

1. Instructional Resources:

   Resource persons in the community such as teachers and business-industry personnel who deal with computers.

   Guidance Department staffs in local schools

   State Employment Personnel Office

   Occupational Outlook Handbook, Washington, D.C.: Department of Labor, 1978-79.

2. Books & Pamphlets:

Ryan, C. W. & Saltzman, G. Career Education Program, Vol. I & II. Boston, MA.: Houghton-Mifflin Co., 1978.

Math and Your Career. A collection of essays edited by Nura D. Turner. National Council of Teachers of Mathematics, 1971.

You'll Need Math. The Math Association of America, Washington, D.C., 1967.

The Math in High School....You'll Need for College. The Math Association of America, Washington, D.C.

Mathematics. The Student, Subject and Careers Series. Guidance Center, University of Toronto, Ontario, Canada, 1974.

Math for Career - Career Packets. Northern Colorado Educational Board of Cooperative Services, Longmont, Co., 1973.

So You're Good at Math. Society of Actuaries, 208 South LaSalle St., Chicago, IL.

Subject: Mathematics/Object: Career Opportunities. Boston, MA.: Houghton-Mifflin, 1975.

Why Not Mathematics? Chronical Guidance Publications, Inc., Moravia, NY, 1971.

CHAPTER SUMMARY

The preceding units represent efforts of the faculty and administration to infuse concepts of career education into the curriculum of human development, education, engineering, agriculture and life sciences at the University of Maine at Orono. The series of seminars which was prepared and presented to the faculty was also instrumental in assisting in the formulation of these end products. Educators who are concerned with the overall career development of their students, as well as their own instructional quality will not make the ultimate choice to use or not use these, or similar units of instruction in their curriculum.

CHAPTER 4

UNRESOLVED ISSUES

In retrospect, implementing career education as a viable concept and series of practices in four-year institutions remains a formidable task. Unresolved anxieties in relation to the future of higher education in this country have created a reluctance for innovation. Fear of growth, particularly if additional funds are required, has affected faculty and staff initiative to experiment with new learning models. A new resolution is needed that will bring about a new frontier in higher education. A quest to challenge established ways of teaching and advising students is essential. In planning for the future of higher education it will be necessary to consider a variety of issues that affect growth and development on the campus.

It is not the purpose of this volume to explore with breadth and depth the serious issues confronting the nation and its multiple higher education institutions. The following issues will, without doubt, impact the growth of higher education and implementation of career education. The issues are: (1) the energy crisis; (2) the food crisis; (3) environmental problems; (4) international competition; (5) transportation problems; (6) technological change and (7) unemployment. A full discussion of each issue is not germane to our purpose, but a partial analysis in relation to career education is needed.

What are the implications for career education? Faculty, administrators, and trustees must come to grips with problems that confront higher education and in turn career education. For example, accountability to many publics will require university faculty and staff to address the quality of teaching. In particular, the teaching process must be examined for relevance of instructional content in relation to the employment needs of our society. The best predictions available suggest that 80 percent of the existing occupations in 1985 will not require baccalaureate level training. Serious questions will be asked by students, parents and the general public regarding the purpose of higher education. As a credentialing agency institutions of higher education will by necessity be required to address issues of occupational supply and demand.

Business and industry will also be seeking greater assurances regarding the quality of our products. Technical and occupational competence will be two areas requiring attention. Graduates who espouse to be engineers, educators or scientists will be required to demonstrate entry-level competencies that are now assumed. It is not unreasonable to predict new forms of pre-occupational screening by employers to assure basic skills in English, mathematics and reading. Other technical skills in engineering, science, the humanities, business and education may also be assessed. The message is becoming increasingly clear, the development of technical occupational skills and attitudes essential to effective living are closely intertwined entities. Higher education must produce graduates capable of coping with a variety of issues, life styles, shifting values, and technological change.

How can we assure quality in career education? It is paramount in all efforts to implement career education in post-secondary institutions, that continued respect for the integrity of all disciplines be maintained. The greatest strength of American higher education is its diversity and availability to a variety of citizens. To maintain this integrity will require:

1. Curriculum development that is relevant to the entry level occupations requiring a four-year degree.

2. Faculty development and training to understand student values, technological change and future societal needs.
3. Institutional commitment to experiment with new training programs and revision of existing study areas.
4. Public support and acceptance that four-year institutions cannot guarantee a commensurate level occupation for all graduates.
5. Increased funding support from federal, state and local governmental sources.
6. Increased alumni support for institutional programs and developmental needs.

In meeting the above challenge each faculty and staff member must be willing to address issues that restrict the development of quality programs. Securing public support for institutional programs requires more than merely increased funding. The image of each college or university is reflected in the quality of its academic, public service and athletic programs. It is our contention that career education adds a qualitative element to the academics and public service thrust.

REFERENCES

Bowen, H. R. Higher education: A growth industry? Educational Record, 1975, 55 (3), 147-158.

Casella, D. Organizing for career education an a university campus. Paper presented at the University Based Career Education Seminar, University of Maine at Orono, Orono, Maine, February 1978.

Froomkin, J. Changing credential objectives of students in post-secondary education. Washington, D.C.: U.S. Department of Health, Education and Welfare, 1974.

Harris, N. C. & Grede, J. F. Career education in colleges. San Francisco, CA.: Jossey-Bass Publishers, 1977.

Marland, S. J. Career education. New York: McGraw-Hill, 1974.